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## Original Articles

### OBSERVATIONS ON A FEW PROBLEMS OF ORTHODONTIA*

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MALOCCLUSION of the human teeth has been a subject of genuine interest in dentistry for more than a century. In every decade of dental history men of intelligence and acumen in the profession have given serious thought to its problems; to its causes, local and constitutional, hereditary, congenital and acquired; and to its treatment, with every variety of appliance from wooden wedges to edgewise arches. Its major problems of growth and development, of when to treat and when not to treat, of why the relapse and what the ultimate result may be, are all, however, still with us. The answers to these questions must come from patient and prolonged study and careful observation.

Reference to recorded opinions over the past fifty or seventy-five years indicates that the biologic phase of these problems was early receiving more consideration from those interested in the work than it has since the establishment of orthodontia as a separate specialty. While it is probable that most of these opinions were arrived at hastily and more or less empirically, the fact remains that malocclusion was being regarded as a biologic problem involving a living variable organism, and not as a proposition in mechanics.

It might be noted that in Talbot's *Irregularities of the Teeth and Their Treatment* (Fifth Edition, published 1903), the author devoted more than four hundred pages to such subjects as heredity, congenital factors, postnatal skull and jaw development and periods of stress, environment, climate, soil and food, etc.; while Angle, in the last edition of his *Malocclusion of the Teeth*, covered the entire subject of etiology in about twenty-five pages. Under this head he cites, in effect, only local causes that have a mechanical influence. The effect of "use and disuse" occupies only a short paragraph, the question

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of heredity is disposed of in less than a dozen lines, and the subjects of evolution, environment, variation, and metabolism are not considered at all.

Since the establishment of orthodontia as an organized specialty in 1901, no single individual has exercised so strong an influence over its trend of thought and methods of practice as has the late Dr. Angle. In his teaching and in his writings his attitude was positive and unequivocal; with young men has manner was inspiring and convincing; his students generally accepted his opinions as final and without question; he was essentially a mechanical genius and an idealist; he dreamed of the beautiful and the perfect; his mind was that of an artist, and his teaching that of a skilled artisan; his conceptions in orthodontia seemed to be those of a Pygmalion modeling a masterpiece, and not those of an orthopedic surgeon restoring to usefulness some malformed part. He was a remarkable personality. It is unfortunate for orthodontia that he was not scientifically minded; that he was not a biologist, or a physiologist, or in some broad way a naturalist. Nevertheless, it must be freely admitted that he did more, both directly and indirectly, for the advancement of this specialty than any other one person in dental history.

Under the conditions just mentioned it is easy to perceive why the biologic aspects of orthodontia have been submerged by mechanics. This has been more or less the situation throughout orthodontic practice at all times, but never to such an extreme degree as during the past thirty-five years. This period has been so prolific in the invention of all sorts and kinds of appliances designed for moving teeth, for predetermining dental arches, and for diagnostic measurements, that it might very appropriately be known as "the machine age of orthodontia." While I do not, in the slightest degree, underestimate the value of its technical features in practice, orthodontia is not—and must not be regarded as—a mechanical craft or a geometrical proposition.

One of the serious problems that confronts us today is how to establish orthodontia on a biologic basis where it belongs, and how to awaken, particularly among the younger men, an interest in the study of growth and development of the face, and of the physiology of its parts.

During the past decade or two a few men have attempted to inject more of the essence of scientific thought into orthodontic teachings. They were spurred on, not only by their own curiosity to know the whys and wherefores of malocclusal anomalies, and the problems of dentofacial development, but also by a desire to lift orthodontia to a plane of higher scientific thinking. They, however, have received little encouragement; they have made scarcely a dent in the mechanical armor in which orthodontia is incased.

At the School of Dentistry of the University of Pennsylvania, in 1923, A. LeRoy Johnson delivered a three-day series of lectures to a group of orthodontists and teachers on the subject of "Basic Principles of Orthodontia." In the July, 1934, issue of the *Journal of the American Dental Association* appeared an article by Samuel J. Lewis, of Detroit, entitled "Development of Orthodontic Education," in which he refers to Johnson's lectures as follows: "*Basic Principles* was without question the best exposition of the fundamental principles of biologic orthodontia ever presented. As Dr. Hellman wrote in his introduction to the monograph, 'its scope was so great and its implications so

far reaching that its importance could not be estimated at the moment.' It was difficult to appreciate at once all that the monograph contained, and it was several years before its worth and implications were generally known."

Dr. Hellman's studies and published reports on the subjects of facial growth and development, evolution and variation of dental structures, etc., are equally notable and sound contributions to the advancement of our knowledge of orthodontic problems.

Unfortunately, unless work of this character is reiterated at frequent intervals it soon becomes buried in the literature, and the younger men in the profession lose its benefit. It would be time well spent for all of us to reread these papers, and others of a like tenor. We might also include reading again *The Origin and Evolution of Life,* by Osborn, and *The Origin and Evolution of the Human Dentition,* by Gregory. The more familiar we can become with this phase of our specialty the better orthodontists we shall certainly be.

## ETIOLOGY

When one realizes the multiplicity of factors active in producing anatomical anomalies, and the readiness with which osseous tissues yield to slight disturbances of unbalanced forces, it is surprising that any of us get through the ordeal of growth as well as we do. In the dental structures habit, accident, mutilation, supernumerary teeth, congenitally missing teeth, congenitally malformed teeth are all palpable local causes, which act more or less mechanically in the production of malocclusion. Such causes are usually easily recognized and, if they are carefully observed, may illuminate somewhat the character of the growth processes active at the time.

Pathologic conditions may also be contributing factors in causing malocclusion, but in recognizable form they are not frequently met with in private practices. A slight paralysis or any similar disturbance that might cause muscular imbalance is likely to produce osseous distortion to the degree of unequal muscular pull. When such conditions do exist, they usually seriously complicate treatment, often to the point of entirely preventing the attainment of what otherwise would be a satisfactory result.

Except for these few simple and more obvious local causes, almost nothing is definitely known of the etiology of the more general forms of malocclusion. Professor J. C. Brash after his comprehensive survey of the literature on this subject concludes: "There cannot be any really satisfactory discussion of the causes of deformities until we are in possession of much more detailed information concerning the sites of normal growth." A few years ago B. E. Lischer, referring to what he classed as "unknown causes" of malocclusion, wrote, "The problems of causation represent a field so vast that its boundary lines are hardly discernible." These observations sound rather discouraging. One thing, however, we have learned, i.e., that as operators we have to deal with the processes of growth and development, forces that are in every respect biologic and vital, and, if we hope for success, we must work *with these forces at a time when they are active.*

DIAGNOSIS

Diagnosis as employed in the practice of orthodontia is a phase of the work which, in my opinion, has been emphasized out of all proportion to its importance. In general terms "diagnosis" simply means distinguishing the differences between conditions or symptoms that are similar. This definition serves very well for orthodontic diagnosis. A classification of malocclusion merely offers a convenient means of grouping these differences, and one classification may serve the purpose as well as another.

The method of diagnosing malocclusion prior to the introduction of the survey by triangulation and of Paul Simon's system of gnathostatics was: to obtain accurate plaster casts of the teeth and adjacent tissues, to supplement these with full front and profile photographs, and to secure x-ray pictures to show the presence or absence of unerupted teeth. With this material in hand one could readily determine the approximate extent of disarrangement of the denture which was being diagnosed, and to which division or subdivision of the classification the case belonged. It was a very simple procedure and, for many of us, entirely satisfactory.

In recent years, however, "diagnosis" of malocclusion has fallen in line with "treatment," and exceedingly complex methods have been introduced. Geometry is employed, and machines are devised for the purpose of predetermining what, according to mathematical survey and charts, the size and shape of each dental arch should be, and to direct, also according to mathematics and charts, the placement of each tooth in the arch. The Simon method of gnathostatics employs intricate measurements, craniostatically posed photographs, with charts and graphs; all of which are based upon arbitrarily established planes, for the purpose of obtaining cephalometric casts of the denture. By this involved system, if one is well versed in the higher branches of mathematics, one is supposed to be able to determine whether any part of the human denture has wandered, even to the smallest fraction of a millimeter, in any direction from its normal (?) relation to some fixed and distant point in the cranium.

This system of craniocephalometrics was developed originally for the use of anthropologists in measuring cranial and facial differences in various races of mankind, and for such ethnological purposes it is well suited and sufficiently accurate for all their needs, but the effort to adapt such elaborate procedures to the diagnosis or treatment of malocclusion is, in my opinion, not only useless but harmful. They are harmful to the extent that they add confusion to the minds of the younger, less experienced practitioners, and they retard the progress of orthodontia along scientific lines. They divert attention from the biologic, physiologic, growth and development phases of our work, and attempt to reduce the whole proposition to one of mathematics. They are based on the erroneous assumption that normal occlusion is a definitely fixed and measurable arrangement of the dental apparatus in all its parts—an assumption which Hellman long ago showed to be a myth, and to have "no biologic justification and no scientific foundation."

One can hardly conceive of an orthopedic surgeon dropping a perpendicular from some chosen point within the torso, then, from exact measurements, chart-

ing with mathematical precision, the contour of knock knee or clubfoot in order to determine to the millimeter the amount of deformity before he undertakes to correct it. Yet such preliminaries preceding his operation would be just as rational as the intricate method of gnathostatics that is being used by some practitioners today in so-called orthodontic diagnosis.

The concern of the orthopedic surgeon is to restore the knock knee or the clubfoot or the crooked spine to a state of usefulness and pleasing appearance. As orthodontists we are nothing more nor less than orthopedic surgeons whose field of operation is confined to the correction of malocclusion of the teeth; and our concern, as orthodontists, is to restore a malformed human denture to a relationship that will render satisfactory service in mastication, and produce a pleasing facial contour. In the words of Robert Louis Stevenson, "He has an ambitious soul who would ask for more; he has a hopeful spirit who should look in such an enterprise to be successful."

Of what importance is it to the patient, or to us as operators, if the denture is slightly forward or slightly back of its assumed correct relation to an arbitrarily placed orbital plane, if in that position it looks well; or if it is slightly east or west of the sagittal plane if, in that position, it serves well for mastication? It is of no importance whatever. All the parent of your patient asks or hopes for, is a set of teeth for the child that looks well and functions well. He cares nothing about their mathematical relation to some distant point in the skull.

Also if, for any conceivable reason, exact relationships were a requisite for the diagnosis of malocclusion, the Simon system of gnathostatics would probably have to be discarded and a more accurate and more dependable one sought, because it has been shown that these planes and the points upon which they are based shift their positions with growth, and that therefore they cannot be relied upon for stability. Wilton M. Krogman, Ph.D., Anatomical Laboratory of Western Reserve University, Cleveland, in a paper presented at the general meeting of the International Association of Dental Research in Chicago, March, 1934, discussed some of these variabilities. Referring to the Frankfort horizontal and "its two terminal points; namely, *porion* and *orbitale*," he says: "Although the relative stability of these two points gives them unquestioned value in the general orientation of the skull, one must never assume them to be stationary. They cannot be employed as fixed points, for their relation to each other and their positions within the complex pattern of the skull must vary with the course of growth and differentiation. Recently Broadbent has demonstrated . . . that the relative location of porion changes during growth. Porion certainly shifts during growth, so that any attempt to base craniometric analysis, in growth studies, on a 'fixed point' will come to grief.

"The foremost exponent of constancy of faciodental relationships is Simon, whose 'orbito-canine law' is based upon asserted dependency of orbitale and canine point: 'Under normal conditions the orbital plane intersects the denture in the region of the canine; and it does this at any age—from five to forty years —in the temporary as well as the permanent teeth' (p. 71, Simon). This assertion has been challenged by several investigators, working with cranial material. Broadbent, Connoly, and Wolfson have worked with adult skulls, while Hellman has worked with the skulls of both children and adults. All these investigators

have reported that, on skulls, 'Simon's law' does not hold, and that an orbitocanine relationship is far too variable to be of value in diagnosis." Further, in referring to his studies of the orbitocanine distance, Krogman says: "The extreme variability of this measurement, which is in substantial agreement with the coefficient of variation of 43.00 calculated by Broadbent, renders it absolutely unreliable as a constant in dentofacial diagnosis. It is obvious that the craniometric orbital plane in the adult skull rarely intersects the canine. Measurements of denture and dentofacial relationships, involving projection and reconstruction of proportions, are so variable as to prevent their formulation in any 'law' of the 'normal.'"

These conclusions reached by Dr. Krogman ought certainly to give one pause for serious thought before he accepts this involved method of diagnosis.

I might say a word more concerning the real simplicity of practical diagnosis: One who has had a few years' experience in orthodontia, and has learned to observe accurately dental arch forms and individual tooth relationships, and who knows normal occlusion when he sees it, can just as readily make a satisfactory diagnosis of malocclusion by a direct study of the mouth as he can from a study of models, photographs, and whatnot. Models are needed for records—they are the most valuable records that we have; from them we can determine the amount of tooth movement accomplished and check on the progress of the treatment; but they are not in any respect an essential requisite for either diagnosis or treatment.

In the practice of orthodontia, mathematical measurements are superfluous, because orthodontia is in no way concerned with an architecturally planned or a symmetrically constructed being. Life is not like that. Life seems to be one enormous experimental biological laboratory, in which it tries many things that Darwin called "fool experiments." The anomalies it produces are without limit in variety and number. H. S. Jennings, Professor of Zoology, Johns Hopkins University, in a little book, *The Universe and Life*, refers to a few of these anomalies as follows: "Life produces types that have no eyes, and that therefore have no chance for continued existence. It produces types that have no wings or have wings that are useless for flying; types with too many legs that get in each other's way; types with imperfect sense organs; types that are monstrous; types that are weak; types whose parts are uncoordinated in action; types that carry within themselves the seeds of their own destruction. In hundreds of ways life produces imperfect types, many that cannot continue to exist even under the best of conditions; many others that, under the most favorable conditions, weakly carry on for a few generations but die under the first change of fortune. . . . Indeed, when one studies minutely and in detail for generation after generation the reproduction of any organism, including in his view large numbers of individuals, nothing is more striking than the great numbers of imperfect, unadapted individuals that are produced. Whether we study the infusorian, the fruit fly, or man, we find produced misshapen creatures, weak creatures, individuals that lack essential organs, etc."

Not only does life produce this myriad of anomalies, but it rarely, if ever, produces a type or an individual that the zoologist or botanist can consider perfect, whose parts are perfectly coordinated, and whose anatomy is perfectly symmetrical.

In view of these facts, it would seem to be little less than futile to attempt to establish a mathematical norm in a structure as variable as the human denture. Every one of us knows normal occlusion—within a reasonable range of deviation—in any mouth when he sees it; he knows when he has attained a satisfactory occlusion as the result of his treatment; and he knows abnormal occlusion when he sees it, for the minute he observes his "beautiful result" beginning to slip his heart sinks a little, for he has recognized the first sign of malocclusion again. He does not need any measurements or craniostatic photographs to confirm his findings; he just plain knows them, the same as he knows his father or mother or friend when he sees them. He does not have to identify them by measurements of any kind.

In opening this paper I remarked that orthodontia has been a subject of interest in dentistry for more than a century. It has been an organized and widely practiced specialty for nearly thirty-five years. In most of the dental schools today there are departments of orthodontia in which the students receive clinical and theoretical instruction in all the divers studies bearing on the subject; the public has been educated to demand this special care for children, and it is intent on securing the most intelligent care possible. At the present time, in the United States alone, there are about seven hundred men and women who devote their entire time to the exclusive practice of this specialty, together with several thousand dentists who give part time to it. On the whole these are an honest, conscientious, and in every sense a highly professional group who place the welfare of their patients above their own personal interests. They have no wish to subject young children to two or three years of wearing appliances unless they honestly believe that the children will be benefited by their treatment. Yet in spite of these facts, all of us know that a large percentage of the patients who are being treated today between the ages of six and ten years would be ultimately as well, if not better off dentally, if their mouths were permitted to develop naturally and without orthodontic interference. It is surprising how little we know about what takes place in the growth and development of the human denture during these years of transition from the deciduous dentition to the full eruption of the permanent teeth.

It is surprising how many cases, which at the age of seven or eight or nine years look like marked malocclusion, will, if allowed to develop to maturity undisturbed, grow into practically normal occlusion. There are hundreds of such cases available to confirm this statement. And many of us have been rather embarrassed at times to find some patient, whom we had intended to treat but for one reason or another could not, who has without our help grown just such a perfectly satisfactory denture.

Under these conditions it seems to me to be imperative that the dental schools should make a really scientific study of this problem of facial growth during these years of transition. This is, in my opinion, the weakest feature of our armamentarium as diagnosticians; it is one of the gravest present-day problems of orthodontia, and one that calls for serious concentrated study. Fortunately it does not offer formidable difficulties. With the cooperation of one or two dental colleges, a few clinics, and one or two homes for children there would be ample material available for such a survey. A large number of children could

be kept under observation; accurate records of growth and development of the dentures and face, in the form of measurements and models, could be made at half-yearly or yearly intervals; and at the expiration of four or five years, a fund of information would be gleaned that would be of inestimable value to orthodontists. It would be an advance stride in orthodontia second to none in its history. It would enable all of us more intelligently to decide when to treat and when not to treat; and what in many of these cases we might reasonably expect to result from undisturbed growth and development.

### TREATMENT

The past generation for us has been an era of prolific invention. We have been deluged with a veritable flood of all kinds of devices and appliances for moving teeth and for determining how far and in what direction they shall be moved. No sooner does one become acquainted with the technic and working of one form of appliance, than something still newer, more elaborate and always much better is offered to him. Farrar believed that each case was a law unto itself and therefore that it required an individually designed appliance to meet its particular needs. Angle believed that an appliance could be designed that would be universal in its application, one which, with slight modifications, would be suited to the treatment of any case. Between these two extremes there have been produced every gradation of appliance imaginable.

As a matter of fact, teeth can be moved with almost any sort of an appliance; and they can be moved at any age from two to seventy-two years. The osseous tissues are noted for their ready response to pressure. The form of appliance to be used is of little importance if it is used with intelligence, skill, judgment, and a knowledge of the possible dangers to the teeth involved. Several years ago I became convinced, to my own satisfaction, through my own experience and my observation of work done by others, that the more complicated the appliance is, the less efficient and more dangerous it becomes. For this reason I prefer to use the very simplest form that can be satisfactorily employed for the purpose; I believe that *bodily tooth movement is very seldom advisable or desirable;* therefore I can see little reason for the use of many bands, brackets, etc. It is surprising to see what extensive tooth movement was satisfactorily accomplished twenty-five or thirty years ago with the most elementary forms of so-called tooth-tipping appliances.

Our problems in orthodontia today are not mechanical problems, and they are not to be solved by new mechanical inventions for moving teeth, nor by mechanical devices erroneously supposed to show how far and in which direction teeth should be moved; our serious problems right now are entirely biologic in nature. If orthodontia is going to progress, it must be along the lines of science; it must be by our becoming better acquainted with the growth processes of the organism upon which we are working; by our learning more about the changes that ordinarily take place in the uninterrupted development of the dentures during the transition from the deciduous to the permanent teeth; it must be by our being able to answer more intelligently the question that is so frequently asked, "What is likely to happen if nothing is done now?"

I have every confidence that orthodontia is going to progress in just this way. It will be slow, but real progress usually is slow. Orthodontia is too vital, too important as a health measure, too much in demand by the medical profession and by the intelligent public to permit its advancement as a biologic science to be much longer retarded by the handicap of its entanglement in mechanics.

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DISCUSSION

*Dr. John V. Mershon, Philadelphia.*—There are three phases to be considered in the discussion of a paper: First, we magnify the meritorious sections of the essay; then we condemn the statements we cannot accept; and, finally, we develop in general the spirit of the paper.

Dr. Kemple's paper affords us considerable food for thought. He seems alarmed lest the mechanical aspect of orthodontia swamp the biologic understanding of it which, we agree, is essential to a proper grasp of the subject.

I am far more optimistic than the essayist regarding this phase of the problem. In the first place, our educational institutions are giving the students a very good grasp of biology, physiology, and related subjects. Furthermore, the younger men throughout the country are absorbing this teaching and are putting it into practice. There is a great deal of independent thinking. Dr. Kemple's criticism may fit a certain group, but the members of that group are, I believe, in the minority. The essayist says that Dr. Angle's students accepted his dicta as final. I think many of his students often departed very radically from the mechanistic attitude of mind expressed in Dr. Angle's teaching. I am quite sure that Dr. Kemple would not want to be considered in the first group. He will agree there are many others who thought for themselves.

The foregoing would indicate that I disagree with the essayist when he says, "They have made scarcely a dent in the mechanical armor in which orthodontia is incased."

On the one hand, I believe the majority of men have as good a biologic understanding of our problem as the knowledge available today will permit. On the other hand, I do not believe mechanics, as used today, is the pernicious influence some think it. We cannot get away from mechanics. It is present in every phase of human existence. Properly understood, properly utilized, it is our chief, in fact our only, instrument in orthodontic practice. Even the theories involved in Dr. Rogers' muscle training are expressions of mechanics. The rôle of orthodontia is to make its artificial mechanics approach nature's mechanics as nearly as possible. All growth has a mechanical aspect.

Long ago, some pioneer, nobody knows who or when or how, discovered that by applying pressure to a tooth, the tooth would change its position. Orthodontia has been developed around this fact. This influence may be the pressure of the tongue; it may be a finger; it may be some chemical force; or it may be a force in growth. There is a force present in all tissues. This is well illustrated in plant life. When a delicate seed sprouts, it will break through a very hard crust of earth. Our orthodontic appliances are a guiding force used to cause a tooth to change its position. We know of no way to achieve the desired result save by some mechanical means. Today orthodontists realize the great possibilities of harm in an appliance. This is a strong evidence that they are getting away from mechanics in the old sense. Our salvation is that we are coming to understand the mechanics of biology and are blending artificial mechanics with the mechanics of nature. This is evidently a "dent" in the old-time mechanical armor to which the essayist refers.

The fact that orthodontists realize that at times the presence of an appliance in the mouth is definitely harmful indicates their appreciation of the problem. For instance, take the period when the second molars, the premolars and canines are erupting after the loss of the deciduous teeth. Many recognize that anything in the mouth during that period will interfere with the natural tendencies and will prevent the fulfillment of nature's plan for the denture. I look upon this as a great step forward and away from the purely mechanical aspect of our profession.

The fact that orthodontists are selecting the time in which to start treatment is evidence of a better biologic understanding of the problem.

The fact that appliances are left off a great deal in order to give natural processes a better chance to develop and that much less appliance work is done than formerly is encouraging. It is evidence that orthodontists appreciate the importance of the growth problem. Just to realize that there are growth forces which must not be interfered with is a step in the right direction.

Another evidence that orthodontists are getting away from the purely mechanistic attitude is that they are selecting the type of appliance in which teeth are not held rigidly but are given freedom so that growth and development can go on during the process of treatment without being purely and entirely subject to a mechanical procedure.

The adjustment which takes place through functional adaptation is definitely mechanical. The fact that appliances are removed in order that this adaptation may take place is evidence of a better understanding of biologic mechanics.

The essayist has said that we know nothing about the causes of malocclusion. This is equally true of the problem of etiology in medicine. We are dealing with the unknown, but, by a process of trial and error, we have developed an empirical knowledge not to be ignored, in dealing with this unknown.

No one knows what electricity is, but that does not deter us from using it. We need not know the causes of malocclusion in order to treat it and in order to serve humanity. Let us accept the position in which we find ourselves. There are hundreds of thousands of cases of malocclusion desperately in need of treatment. The beautiful results we obtain and the service we render make it seem a little foolish to dwell too much on what we do not know. We get along fairly well, after all.

Etiology is a research problem fundamentally, and research men are born, not made. The study of life phenomena is the work of the biologist. Many able men are at work with the resources of big endowments back of them. Let us leave this research work to them. Our satisfactory results would indicate that at least we are approaching our problem in a way that is not apparently harmful.

I give research its full due but let us go back to treatment. This is the problem ever before us. Treatment must be undertaken with the knowledge available today.

I am in full accord with Dr. Kemple regarding diagnosis. Why should we use plaster models when we have the living patient before us? We know that the development of the human organism cannot be measured with a yardstick.

Dr. Kemple's former paper regarding early treatment, with which, no doubt, all of you are familiar, was a real contribution to the literature. Probably his modesty has prevented his mentioning it today. In closing, let me call this to your attention. In that paper, Dr. Kemple gave us something which would help us in our *daily* routine of treatment. Furthermore, he learned what he gave us *clinically*, just as most of the material of value in orthodontia has been acquired. Why do most men fail to evaluate clinical observation properly yet laud the work of research men to the skies?

This paper presents a very good survey of what we do not know. This is a good approach in finding out. In the meantime let us help one another to serve our patients better. A child developing in the wrong direction will not wait for help until we can tell "why" and "wherefore" the malocclusion. He does not care what name we give his ailment, but he is mightily interested in being cured!

*Dr. Milo Hellman, New York.*—The customary procedure in the discussion of a paper before a society is to make a few complimentary remarks to the essayist, crack a few jokes and thank the society for the privilege of doing it. Knowing Dr. Kemple as I do, I am sure that he will not mind if I dispense with these formalities. The trouble is that in doing so I am at once confronted with a difficulty. That is, I shall be obliged either to sit down or to say something. Since it is really no great task to say something after being stimulated by the ideas expressed and by those in the mind of the essayist, I shall therefore not sit down.

It is rather paradoxical that Dr. Kemple should be making a plea for the scientific aspect of orthodontia in a paper which could not be regarded as scientific. He nevertheless attains his object in a simple, sensible, and logical way. That a plea of this sort is timely at any

time is obvious. To my way of thinking he is wrong in certain instances. For example, in referring to "a few men who have attempted to inject more of the essence of scientific thought into orthodontic teachings" he says, "they have received little encouragement." On the contrary, I am inclined to the belief that they are constantly spurred on to further study by the resistance of "the mechanical armor in which orthodontia is incased." The fact that scarcely a dent has so far been made in it may yet lead to that mighty stroke which will shatter it into fragments.

The power of enlightenment is irresistible. The cumulative effect of knowledge cannot be measured during the course of its integration. Once it is complete, everything in its way is swept aside. Let me give you an example.

Occlusion of the teeth, which has always been looked upon from a purely mechanical aspect, is now furnishing valuable information on the problem most baffling to orthodontists. Distinctions, for instance, between the normal and the abnormal aspects of a dentition were hitherto made on the differences in number of contact relationships of certain anatomic parts of the teeth. By the use of scientific methods of procedure in studies on malocclusion of the teeth certain facts have been brought to view which shed a good deal of light on important phases of the problem of development. Thus evidence so far obtained warrants the assumption that malocclusion of the teeth is not a pathologic condition. Its manifestations in many instances are not unlike the resemblances and differences encountered in the general problem of variation. The special features concerned are: position and occlusion of the teeth, form and size of the dental arches, and size and relationship of the jaw bones. It has, however, been observed that variations in these features appear early in life and that they often undergo marked changes in the course of development. But, because they often become accentuated by fluctuations in intensity or speed of development, they were erroneously taken as deviations from what is understood to be the natural course of events. Malocclusion was then thought to be due to unfavorable environmental conditions, such as are liable to be brought about by accidents, faulty nutrition, and pathologic conditions. Since deviations of this sort, however, are observable at birth, it is now certain that some at least are of prenatal development and not, as has been thought, invariably due to conditions subsequently encountered. It is now clear that certain malocclusal manifestations hitherto considered as deviations may now be regarded as phases of normal variation.

It has recently also become evident that the variability in each of the features named is independent of that of the others. As a result of the recognition of this fact, it is now evident that certain disturbances in relationship of the teeth are often only passing phases. For example, the differentiation of the dentition, as it is interpreted from the eruption of teeth, may be lagging behind the growth of the jaws or vice versa, and yet both may be within the normal range of variability for a particular stage of development. At the next stage following, the two features may reverse their intensities of development and reestablish their harmonious relationship. It is only when disharmonious development continues through several stages that the resultant effect is an abnormality. The recognition of these facts is already having a far reaching effect on the practice of orthodontia, because it furnishes at least a rough measure for a more adequate procedure in developmental diagnosis. That is, orthodontists are now more hesitant than before in starting the treatment of some cases of malocclusion when they appear at certain stages of development, because they are not so sure whether it is an anomalous condition or only a passing phase of development.

The trouble is that, besides adequate knowledge of the general problem of development and its intelligent application for our specific purpose, no iron-bound standard has as yet been devised which can be used indiscriminately. Because of the fact that preconceived notions, traditions, and beliefs still play an important rôle in our emotional life and in our everyday experiences, we are unable to resist those misleading features which confuse our understanding and divert our actions. Panaceas of all sorts are usually attractive outlets from confusing situations. As a consequence, we easily fall prey to the imposition of all kinds of pseudoscientific devices among which in our bewilderment we are unable to discriminate. Thus, some fall for different kinds of appliances; others for standards by which methods of procedure can be measured. The obsolete Hawley arch, for instance, is still the guiding star in some orthodontic practices and most of us are willingly submitting to the rule of the

canine law. The fact that sufficient scientific testimony has been brought forward to prove that the former is futile and the latter misleading does not seem to bother us in the least. The reason for it is that we are either indifferent, unwilling or unable to discriminate between what we actually need and should be striving for and what is handed out to us and should be discarded. In this respect we are not unlike the English student about whom the following story is told.

Before getting down to his serious studies in the evening, an English student thought it advisable to go to a liquor shop for the proper stimulus. His choice was whisky and soda, but before he realized it he was repeating the stimulus until the early hours of the morning. By that time he was pretty well "lit." Of course, under the circumstances he could not very well do any studying, so he went to bed. The following evening he dispensed with the whisky and ordered brandy and soda. The sequence of events happened as the night before. Again he could do no studying. The third evening, repeating his customary procedure, he dispensed with the brandy and ordered rye and soda, with the same final results. On the fourth evening he thought the matter over, and, since examinations were approaching, he felt that the matter required some serious thought. Using the scientific method, he began to analyze the situation thoughtfully. Upon careful examination of the facts, he found that the first time by using whisky and soda he became intoxicated; the second time by using brandy and soda he again became intoxicated; the third time by using rye and soda he also became intoxicated. He then concluded that, since one of the components of the drink was different in each case, i.e., whisky, brandy and rye, and since he became uniformly intoxicated, the trouble was with the other. He therefore decided to omit the soda.

*Dr. I. B. Stilson.*—Dr. Kemple said he believed it was impossible to make mathematical drawings of the eventual position the teeth should occupy and make them symmetrical. In the limited experience I have had with the gnathostatic method of diagnosis I have observed a good many cases in which the teeth were nearer the median line on one side than on the other, and the plane of occlusion was farther from the Frankfort plane on one side than the other. In those cases I have come to the conclusion that if we moved the teeth that are nearer to the median line an equal distance to the teeth on the other side, we should have the roots fairly well out of support from the tissue. I have observed that the face on that side was not symmetrical with the other side. The median line was nearer one side of the entire face, and I could not believe that it was a good place as far from the median line as they were on the other side. Whether it is due to posture, habits of sleeping, or sitting with the hand on the face, or what, I do not know, but faces are not symmetrical. Oculists tell us that one eye in almost every person is nearer the nose than the other; when they fit glasses they do not make the lenses the same distance from the nose and try to bring the eye out to it, but they place one lens nearer the bridge of the nose than the other. I am in accord with Dr. Kemple's statement that we cannot make dentures symmetrically.

There was one other thought that he expressed, and if I understood it correctly I should like to take issue with him on that. I cannot quote him exactly, but I gathered that he thought there were a great many children between the ages of six and ten years whom we thought needed treatment who would be much better off if left without treatment. If he said there were few such cases, I would agree with him; but when he said there are many such I cannot agree with him, and for this reason: The causes producing the incipient malocclusion that we observe probably still exist. If we could remove those causes, then I should say perhaps they would be better not treated, but the causes will still remain for the lack of function, or whatever it may be.

In my early practice a mother came to me with two small children. She had had two older children treated. These two smaller ones needed treatment. All four of those cases were lack of growth due to a lack of function. She had a baby, the fifth child. She said to me, "Has my baby got to come up here and have this treatment too when he gets older?" I explained to her what I believed would be the procedure to avoid the necessity of treatment for the baby: an entirely new diet, methods of eating, and so on, in order to stimulate function. When I got through, she said, "Well, I guess it will be easier to have the baby treated when he needs it."

*Dr. Richard Lowy.*—I recognize the fact that for one to discuss a paper after only having it read to him for the first time is taking a lot upon himself. I may have misunderstood some of the things that the essayist has stated; therefore, if I make certain criticisms of Dr. Kemple's paper, and he really did not make that particular point, I apologize beforehand.

I also realize that when Dr. Kemple started his essay he mentioned the fact that his experience had been limited, and he really did not want to tell how many years he had been in orthodontia; therefore, I understand that I am taking quite a bit upon myself as a neophyte in orthodontia to take exception to some of his remarks.

One must realize that if he does not have a means of making a comparative diagnosis, the young student is dependent upon a rule of thumb or may be dependent upon what I call the old American hunch. To look at a patient in the chair and determine what type malocclusion, or whether there is a malocclusion, and just by that type of diagnosis to determine what your findings are, is a rather difficult procedure to teach a young student as a type of diagnosis. We all cannot have a Dr. Kemple or a Dr. Mershon at our beck and call, and when we have a new patient have him look in the mouth and say, "You have so-and-so." We have to learn how to determine what we have; and if we use that particular method, I am afraid we are going to run into trouble right from the start. After all one can say that diagnosis itself is not necessarily an essential part of the treatment; when all is said and done, it is the mechanical aspect that determines what the result is to be. If you have made an improper diagnosis, it is quite obvious that the mechanical therapy, or even the myofunctional therapy, I think it was, will be incorrect. So my conception of diagnosis is a definite thing, somewhat as follows: It is a search for a determination of the difference between the existing condition of the denture as compared to what you wish to accomplish in treatment. Therefore, one has to use means of comparison in order to determine it.

Originally Angle took cognizance of that dilemma because he gave us two points, namely, the mesiodistal relation of the teeth. He also said that the maxillary molar was more or less constant; so we had the fixation of the molar. If the teeth had moved in one direction or the other as far as the molar was concerned, there was either a mesial or a distal relationship. We have since learned that the maxillary molar is not constant, and if we were to utilize that type of diagnosis, or if we were to use something similar, we should be liable to run into difficulty because it explains some of our failures. If we have a distoclusion or a Class II, Division 1 malocclusion, we might attempt to move the mandibular teeth forward, and that is all we would do, whereas in reality what we needed was to move the maxillary teeth distal in order to correct the condition.

Simon realized that, and he realized that our problem was not a mathematical but a biologic one; therefore he tried to work it out on biologic principles. When he determined the line which he called the orbital plane, he recognized very early that it was variable. He also recognized that it was a fiction. He recognized there was a growth in the patient, and, therefore, perhaps at times the orbital plane would be farther forward, but the main thing that Simon wanted to give was the fact that there was a great need for a starting point in diagnosis, and it would not have made a bit of difference if that line had fallen through the premolar or through the lateral incisor, the idea was to have a starting point. We have a starting point, and from that starting point we can determine whether or not one part of the denture has shifted forward or one part of the denture has moved distally. In many cases when we say we have a unilateral distoclusion, how do we know whether the unilateral distoclusion is the fault of the mandibular teeth or whether the unilateral distoclusion is the fault of the maxillary teeth? We know it is there, and under the old form of diagnosis we do not really know which is the actual condition that has to be changed; whereas with a form of diagnosis such as Dr. Simon has presented, we know whether one side, the maxilla, is going forward or whether it must be brought distally.

The next point was one that Dr. Stilson made. I saw a case in Dr. Waldron's office in which the maxillary arch was quite narrow, and on looking at it we knew that we needed to gain width. By marking the median plane on that, we learned that the right side of that denture was approximately in the correct relationship, but—by that I mean it was an aver-

age according to Pons index—on the left side it was about 8 mm. too narrow. Regardless of treatment, if you put on a lingual or labial, whatever you call it, in order to gain the necessary width, what would happen? You would continue to have asymmetry of that arch because in that appliance when there is an action there is always a reaction. As a result both sides would be widened; so you would have as much asymmetry as prior to treatment. But if you know which side is at fault, you can construct the appliance so as to maintain one side in a fixed position and change the other side.

*Dr. Raymond L. Webster.*—Dr. Kemple said that one means which would be at our command for future reference would come from an examination of children over a period of time perhaps in clinics, in homes, and in hospitals. He said that that means of measuring growth would be to our advantage. I heartily agree with him. My question to Dr. Kemple would be, what method of measurement would he suggest?

*Dr. Frederick C. Kemple.*—I appreciate very much the courteous discussion that has been accorded the questions which were being considered in this paper. Dr. Mershon spoke about my being "alarmed lest the mechanical aspect of orthodontia swamp the biologic understanding of it." I am not alarmed at all. But I do regard it as exceedingly unfortunate that, for the past thirty-five years, the study of mechanical means for moving teeth has so completely overshadowed the study of the biologic phases of orthodontia. Nor can I agree that the "majority (of orthodontists) have as good a biologic understanding of our problem as the knowledge available today will permit." As a matter of fact, this phase of our subject is only partially comprehended by a very few students of anthropology and evolution who have given some thought to the incidence of malocclusion in the human denture. When these men tell us that the standard deviation from what they regard as a fair norm in occlusion is more than 40 per cent, then, I maintain, it is time for us to discard mathematical surveys and Simon methods of diagnosis for a more rational conception of just what is, and what is not, malocclusion.

Dr. Hellman has frequently observed that "many manifestations of malocclusion in the child denture are only passing phases of normal development." Those of us who have been willing to wait a few years, before starting treatment for young patients, in order to note the changes that occur during the period of transition from the deciduous to the permanent dentures have had ample opportunity to verify Dr. Hellman's findings on this question. We have not infrequently seen these apparent malocclusions gradually develop into dentures that fall well within the range of the normal deviation. Often the results of these unhampered changes have been so pleasing that many of us would be glad if we might claim the credit for them.

In reply to Dr. Lowy, I am confident that he, or any other of the younger men, can just as readily recognize malocclusion, in any form, as can those who have had more years of experience. They do not need mathematical surveys or gnathostatics. By a direct study of the mouth and of the facial contours not only can they make a sufficiently accurate diagnosis, but they can, in the same manner, determine a rational and satisfactory means of treatment. Surveys and gnathostatics serve more to confuse and mislead the operator than to aid him. When they are used for diagnosis, it implies that the malposed dentures can and should be brought into a definite relationship with those planes or points which are supposed to be the fixed landmarks of the particular system being employed. To attempt to bring about such a relationship is not only unnecessary and usually impractical but, as a rule, impossible.

Dr. Webster asked what method of measurements should be used in noting facial growth? I should say that any one of the modern systems of cephalometrics would serve the purpose. The Simon system would probably be as satisfactory as any. But none of them is of any practical use either in the diagnosis or in the treatment of malocclusion.

# COURSE OUTLINE FOR TEACHING UNDERGRADUATE ORTHODONTIA

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FEW, if any, of the present undergraduate courses in orthodontia are entirely satisfactory to those presenting them. This may be the result of the handicaps under which the department functions in a given school. Or apparent inadequacy of a course may be due to trends of thought held by members of the individual departments. Thus some may want a course that is almost entirely theoretical, while others prefer one that includes some practical work.

In order to present a worthwhile course in orthodontia to the undergraduate the following convictions must be held by members of the staff:

A. That the student should have a good foundation in this subject in order to permit him to diagnose correctly; to prevent the occurrence of adverse conditions by understanding etiology; to intercept, by preventive measures, those cases already started; and to correct those cases which from his training he could prognosticate, with a reasonable degree of accuracy, would lend themselves to the less complicated methods of treatment.

B. That, as a secondary consideration, a systematic course of practical value should be planned and later instituted on a working basis.

Much has been said pro and con regarding the first consideration, or what should be taught; but this must be determined, partially, by the conditions existing in each individual school.

Not so much has appeared in the literature, however, to stimulate thought relative to the best method of presenting this subject to the student. It is, therefore, with the second consideration that this article will deal, not with the presumption that the outline of the course presented is the last word in orthodontic undergraduate teaching but in the hope that it will prompt others to present their methods or ideas in written form so that agreement and uniformity, as nearly as possible, may result. Neither is it to be understood that the course outlined is being carried out completely in our school at present, but it is a goal toward which we may proceed.

Since the content of the theory to be taught has been quite uniformly agreed upon by all interested in teaching the subject, that part of the outline is rather trite and not at all detailed. The same observation may be made by some in its entirety and, if such be the case, constructive criticism will be gratefully received.

If one might choose a theme song in regard to orthodontics and the student, it could well be education with special emphasis given to diagnosis and prevention.

I am convinced that the majority of patients needing orthodontic attention should be referred to the specialist, but I am equally confident that through education in the subject we can develop in the minds of the student (our future dentist) the judgment to select cases for treatment that are well within the bounds of his ability. We must educate him to understand the possible pitfalls in treatment if for no other reason than to counteract the glowing advertisements relating to the ease and speed with which this work can be accomplished as portrayed by certain laboratories and manufacturers of appliances.

I believe I am familiar with all the arguments, so far presented, for or against the teaching of corrective orthodontics to undergraduates. For those who contend that this phase of the subject has no place in the teaching of orthodontics the following outline may strike a discordant note. The number of hours indicated in the outline is approximately equal to those being devoted to undergraduate orthodontia in the department with which I am connected.

SOPHOMORE YEAR

*Theory:* One hour each week.

A. Lectures on the so-called normal growth and development of the face, with emphasis on the jaws, from embryonic to adult life.

B. Consideration of abnormal as found in malocclusion and malformation of the jaws and face, including:

1. *What?* 1. What is wrong (in what manner do these cases deviate from the normal?).

2. *Why?* 2. What is the cause (if possible point out the etiologic factor or the *resultant* of several factors which acting together may produce such a condition).

3. *How?* 3. What can be done to prevent or overcome such a deviation from the normal (not in detail at this time but in general in order to give the student an insight into the possibilities of preventive and corrective orthodontia).

*Technic:* Two hours each week.

1. Impression taking, assembling, boxing, and pouring the impressions and trimming the resulting casts.

2. Soldering exercise—end-to-end joining of wire; soldering spring wire to larger gauge wire and bending spring wire into several types of auxiliary spring formation.

3. Appliance construction:

a. Plain round labial with one end round to insert into a round buccal tube while the opposite end of the arch wire has a small section of square wire soldered to it to insert into a rectangular buccal tube. This is done to illustrate the difference in certain types of anchorage.

b. Plain round lingual arch wire with the necessary types of auxiliary springs.

NOTE: The appliances are made on identical casts reproduced from the original cast of a practical treated case, and the same molar bands are used for

both appliances. The point is made that either appliance can be used to treat the case, and the treatment is discussed in the theory course under treatment of cases.

JUNIOR YEAR

*Theory:* One hour each week.

More detailed discussion of the following:

A. What is wrong = diagnosis.

B. Why = etiology.

C. What can be done = explanation of preventive measures followed by a description of appliance design and operation in treatment of cases.

*Technic:* Practical diagnostic clinic. Time: Two hours, each section, alternate weeks, first semester.

Diagnosis by the student of cases needing orthodontic attention. Class to be divided into small groups; and patients, carefully selected as to type, presented for examination after which the student hands in a written discussion covering the following points:

1. What is wrong—classification.
2. His ideas as to cause of the condition.
3. How the condition might have been prevented.
4. What movements would be needed to correct the condition if treatment should be instituted and if not, why not?
5. Later in the year methods of producing such needed movement might be added.

Before the end of the two-hour period, the instructor in charge of the group would discuss the case, subsequent to the handing in of the papers, covering the points the student should have covered in his paper.

The second semester of the junior year would continue with theory lectures and eventually, perhaps, some clinical practice.

SENIOR YEAR

*Theory:* One hour each week.

Emphasis on diagnosis, etiology, prognosis, prevention, and treatment by exhibiting practical cases, formerly treated, by using lantern slides, models, x-ray pictures, photographs, etc.

*Clinical Practice:* Two hours each week.

Each instructor is assigned a definite number of students in the senior class, a certain number of whom will report to him, at stated hours, for practical clinical instruction and practice. The instructor is responsible for the selection of patients suitable for undergraduate teaching purposes and is further responsible for the making and keeping of appointments. An example of this method of instruction follows:

Each instructor has, we shall say, six students report to him from 3 to 5 P.M. Monday afternoon of each week or fortnight. Six carefully selected types of cases, suitable for teaching undergraduates, are ready in adjoining chairs.

The instructor and the six students together examine each case to determine progress and decide on the next procedure in treatment, which the students enter in their notebooks on a treatment sheet provided for each patient. Student A then goes to Patient 1 and performs the necessary adjustment (if any) and tabulates it on the master treatment sheet for this patient. At the same time Students B, C, D, E, and F in the same way care for Patients 2, 3, 4, 5, and 6, while the instructor in charge moves from chair to chair as needed. If one or more students have no adjustments to make on any particular appointment they can help the other students in the group with their adjustments. The following week or fortnight the same patients appear, and the same instructor and same group of students make the preliminary study of progress and intended adjustment on all patients as before, after which Student A takes Patient 2 instead of Patient 1, and every other student progresses to the next patient, Student F starting again with Patient 1.

In this way the student gets to see progress on six patients and becomes familiar with the problems encountered in each case by actually working with it and has the benefit of all the cases instead of one.

# THE CRISIS IN ORTHODONTIA*

## PART I

### 4. CRITICAL REVIEW OF THE PUBLICATIONS OF J. A. MARSHALL

ALBIN OPPENHEIM, VIENNA, AUSTRIA

(*Continued from page* 533, *June*)

At the outset of his investigations Marshall expressed the opinion that "unusual mechanical stress" or "systemic causes" are responsible for the occurrence of root resorptions. These two factors are also stressed in the conclusions. Detailed reports are available in five animals (monkeys 81, 2, 4, 35, and 90)[6]; of these monkeys, 81 and 35 were on a regular diet, monkeys 2, 4, and 9 on a deficient diet. In most monkeys, merely traumatic resorptions on the sides of

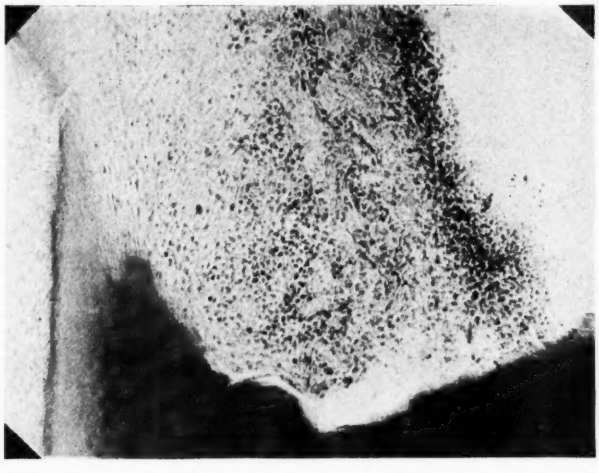

Fig. 2.—The characteristic ragged apical border of an absorbed area. Hematoxylin and eosin stain. (Marshall: Internat. J. Ortho., 1930, p. 1039, Fig. 7.)

the roots were observed. This leaves only monkeys 2 and 35 in which apical root resorption occurred. I was unable to find an illustration of the apical resorption of monkey 35 in the literature available to me. Of both animals it is stated: "In both cases there was observed resorption of bone and apex of root. In the animal on special diet the degree of resorption was relatively great. In fact in monkey No. 2, the pressure was such that the pulp in the left central was strangulated." (Marshall,[6] p. 15.) Therefore, the resorption of the apex in this monkey No. 2 falls in a class by itself; since it may have been the result of strangulation of the pulp and subsequent severe periapical inflammation and abscess formation (Fig. 2). It is impossible to determine how much of the root resorption in this tooth might be due directly to the orthodontic force and how

*From the Department of Orthodontia of the Dental Institute of the University of Vienna.

much to the inflammation accompanying the death of the pulp. The situation is also complicated by the fact that this tooth still had a wide open apical foramen.

Marshall realized all these limitations:[5] "These factors [incompletely formed apex and necrotic pulp] tend somewhat to obscure the result in this particular animal in so far as apical absorption of the left central incisor is concerned," and he even suggests the possibility ". . . . that the absorption had no relation whatever to the orthodontic appliance" (pp. 1041 and 1043).

Marshall's assumption that the apical resorption in this tooth might be due to inflammation seems to be correct; since the genuine extensive root resorption in man is always symptomless, without any pain or inflammation. Monkey No. 2 can, therefore, not be considered as evidence of experimentally produced true apical resorption. A detailed consideration of the conditions in monkey No. 35 is impossible, since no illustrations are available.

Therefore, from the entire series of monkeys, there remains only this one doubtful case (monkey 35) of experimentally produced true apical resorption.

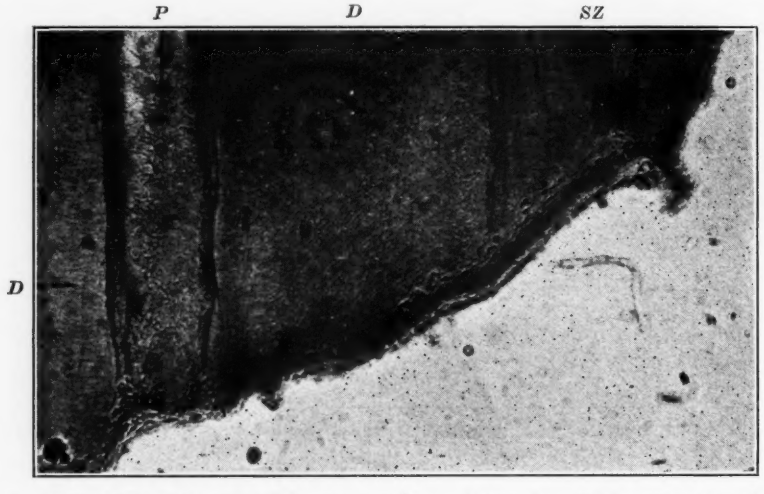


Fig. 3.—Resorbed root end of human molar. Areas in which resorption is still active alternate with areas in which deposition of cementum has taken place. *D*, dentin; *P*, pulp; *SZ*, secondary cementum. (Gubler[3].)

The changes that take place in the active stage of apical resorption can be recognized from a specimen of Gubler[3] (Fig. 3) and from an incidental finding in my own retention specimens (Fig. 4).

As far as the problem of diet is concerned, Marshall's results are by no means convincing. One of the reasons for this is that in all animals on a special diet, except in monkey No. 2, the diet was repeatedly changed to a normal one. How little reliable his deductions are is best illustrated by a comparison of monkeys 81 and 4; from these two animals definite conclusions are drawn with regard to diet.[7]

The difference in the histologic findings in these two animals is that the monkey on normal diet (81) showed[7] "only slight degree of cementum absorption," whereas the monkey on a special diet showed "a great deal of radicular absorption and only slight evidence of apposition" (p. 541). Let us compare the intensity of force and the duration of the experiment in these two animals.

In the monkey on the special diet (4) the duration of the active treatment was 287 days and "the tension of the wires was increased on March 13, although considerable movement had occurred."

In the monkey on regular diet (81) the total time of active treatment was 208 days; no renewal of the force was reported.

The reader of Marshall's report is faced by a difficult dilemma. On the one hand, forces were used in the control animal which were strong enough to cause a fracture of the alveolar process. Marshall realized this because he states,[5] "It is apparent that in the effort to produce apical absorption in this experiment too great a tension was applied" (p. 15). Kronfeld[4] has pointed out the difficulty of evaluating the influence of the dietary factor in view of

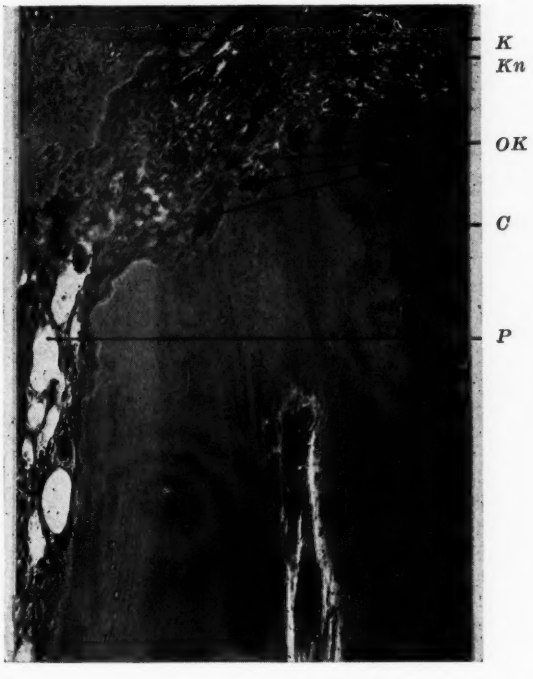


Fig. 4.—Apex of one of the teeth used for the experiments with retention. Genuine apical root resorption, characterized by the presence of numerous osteoclasts, *OK*, at the *root end;* new formation of bone, *Kn*, on the inner solid plate of bone, *K*, opposite the area of root resorption. *P*, periodontal membrane; *C*, cementum. Magnified 100 times. (Oppenheim: Intermat. J. Ortho., 1934, p. 549, Fig. 13.)

the intensity of the mechanical force: "Since Marshall worked with forces that were strong enough to cause an actual fracture of the alveolar process, the part played by the diet in the production of the lesions is hard to determine" (p. 384). Yet in his most recent discussion on the subject Marshall[8] calls the statements found in literature about extreme pressures "figments of the imagination of the man who wrote it." *Moreover, the force in the animal on the special diet acted two and one-half months longer than in the control animal and was once renewed during the period of treatment.* The latter fact alone could easily be sufficient to explain why at the end of the experiment "only slight evidence of apposition" was found in this animal.

Thus, there are at least four factors involved which may be partly or wholly responsible for the difference in the histologic findings in monkeys 4 and 81:

(1) The very strong forces used—without definite knowledge whether or not the forces in monkeys 4 and 81 were alike.

(2) The longer time of treatment in monkey 4.

(3) The renewal during treatment of the force in monkey 4.

(4) The difference in diet.

Who is there to decide which one of the four factors is responsible for the difference in the results?

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*(To be continued)*

# SOME PROBLEMS OF TREATMENT*

N. J. AINSWORTH, M.C., L.D.S., L.R.C.P., M.R.C.S., LONDON, ENGLAND

WHEN I agreed, rather more than a year ago, to contribute a paper, I had in mind a series of cases I had treated at the Royal Dental Hospital by the extraction of a mandibular incisor. The immediate results of these had been invariably excellent, and for some years I was enthusiastic about this simple treatment. The later results, however, were not so good; the imbrication of the four mandibular incisors, which was usually the original condition, was frequently replaced by a very similar imbrication of the remaining three, often nearly as marked and unsightly, so that it seemed as if the incisor had been sacrificed for nothing. I then began to collect cases of late results of such treatment and the results seemed to confirm my suspicions.

Mr. Chapman, at the meeting of October 7 last year and again on January 16, very effectively dealt with the question, and the point has been raised at several subsequent meetings; nevertheless, one or two points which I do not think have been stressed hitherto are rather well brought out by my own series of cases, so that I shall take the risk of flogging a dead horse.

Cases in which this treatment is adopted fall into two classes; one is that of slight crowding in the mandibular incisor and canine region, usually a Class I or mild Class II case (Fig. 1). The loss of the premolars is considered to provide too much room and in Class II cases would accentuate the recessive appearance of the mandible.

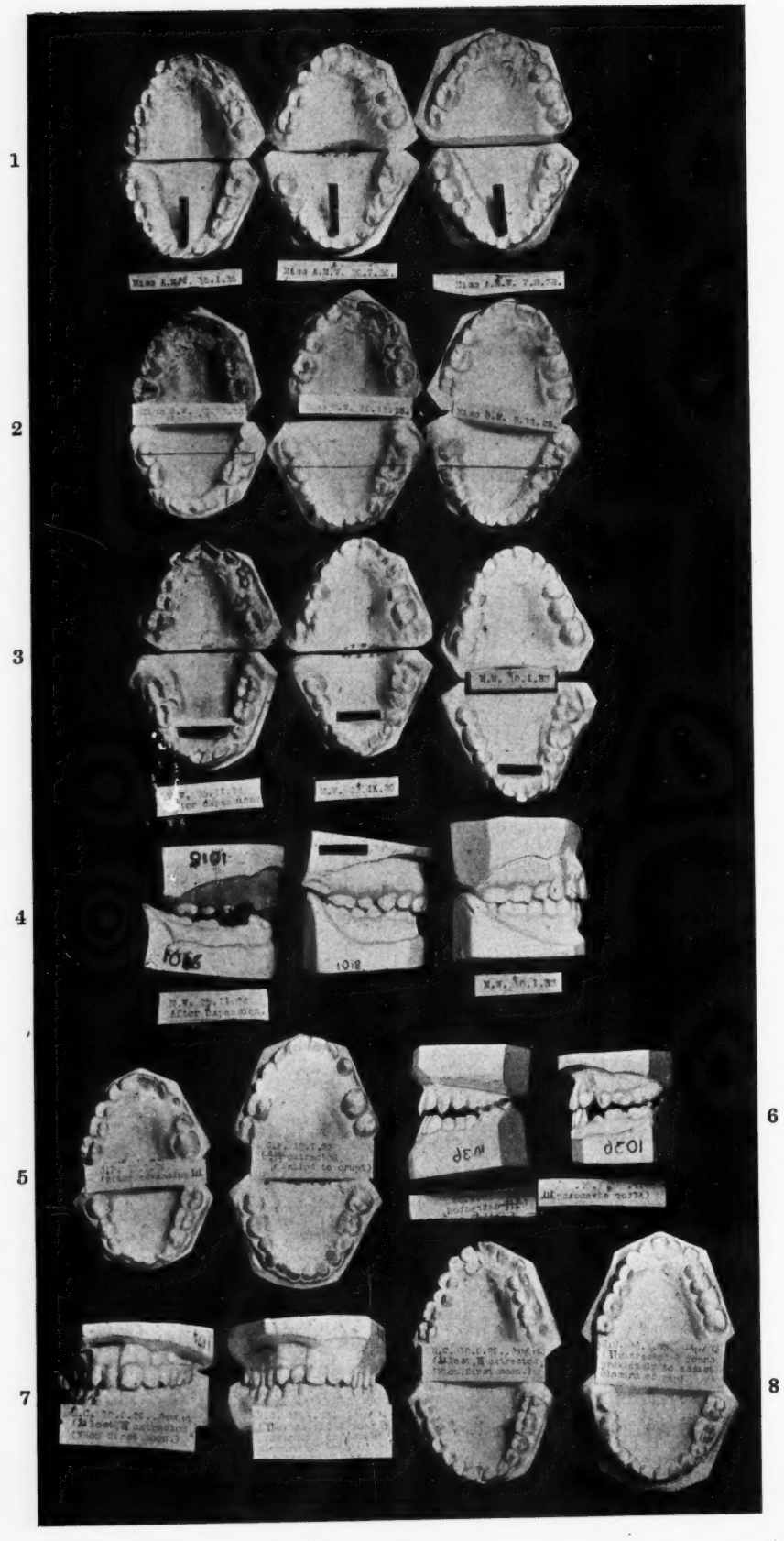
The other class is that where an upper incisor has been lost and it is considered wise to reduce the size of the lower jaw, so that the upper teeth may come together and close the gap (Figs. 9, 10).

The treatment in the first class is, I submit, based on the misapprehension that the remaining teeth in the mandible will slide round the alveolar ridge like beads on a wire, the bony arch remaining otherwise the same as before extraction, and this actually does seem to happen as far as the immediately adjacent incisors are concerned, the gap often being perfectly closed in a very short time. Unfortunately the extraction seems to be like the removal of the keystone of an arch, and in the course of time the two halves of the mandibular alveolar ridge collapse on each other with a resultant narrowing which is maximal in the intercanine diameter. The canines in addition tend to slope mesially and the mediodistal rotation, which is so common in cases of crowding, persists or is accentuated.

In the case of extraction to allow a gap in the maxillary incisor region to close, this collapse of the mandibular arch is just what is wanted, and the result is generally excellent, provided that such a collapse is not unsightly in itself.

The logical outcome of this line of reasoning would seem to be the insertion of a retainer immediately after the extraction if the collapse of the arch is not

*Transactions of British Society for the Study of Orthodontics, 1933.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desired. The difficulty is that the collapse is gradual over a long period. In the case shown in Fig. 1 the collapse was not more than half completed by the end of the first year, and progressed slowly for six years after that. (There is also a shortening of the molar incisor distance greater than the difference between the width of the deciduous molar and permanent premolar. Molar 0.48 cm., premolar 0.35 cm.) The intermolar diameter is also very slightly reduced, but this is a very common occurrence in the mandible and no significance can be attached to it.

I would particularly draw your attention to the final shape of the arches; they are definitely V-shaped. This loss of the prominence of the canine region is generally conceded to be a disfigurement, and it was true in this particular case, though the general result was considered satisfactory. This V-shaped arch is in marked contrast to that produced in most cases of extraction of $\frac{4|4}{4|4}$ (Fig. 2, compare Fig. 1.) It is interesting to notice the method of collapse of the mandibular arch. In each case there is a reduction in the molar incisor interval and a narrowing of the intermolar width, but in the case of Miss B. W. (see Fig. 2) the intercanine width is practically unaltered. The propping apart of the mandibular canines by the four incisors maintains the line of the maxillary incisors and canine, as can be seen.

The next case (Fig. 3) also ranks as a success. This case was originally treated by expansion, but the expansion was not maintained, and it was decided to allow it to collapse and to treat by extracting $\underline{4|4}$. This was done in 1924. Two years later the condition was as shown, the arch was back to its original width (not shown here) but a mandibular incisor was squeezed out of alignment and was keeping the $\underline{1|1}$ forward also. It was therefore extracted in 1930, and three years later the other $\underline{1}|$ was found to be similarly squeezed forward, with considerable loss of intercanine width. However, the usual backward collapse of the mandibular incisors (0.25 cm. molar incisor distance) has allowed the maxillary central incisors to fall back, so that the appearance on the whole is improved (Fig. 4). This case also shows a slight intermolar narrowing since loss of $\overline{1}|$ (Fig. 3).

Last, here are two cases of extraction with the deliberate intention of reducing the size of the mandibular arch. The first case (Figs. 5 and 6) is Class III, in which the maxillary incisors had been pushed over the mandibular incisors by means of screws. The resulting proclination of the maxillary incisors was rather unsightly, and there was imbrication of the mandibular incisors which would probably not have corrected itself even if $\overline{4|4}$ were extracted. It was decided therefore to extract $\overline{4|1}$. The incisors and canines have taken on a lingual inclination, but the twisted lateral incisor has righted itself without help, and as the mandibular arch has not collapsed any further in the last three years, I hope that there will be no overlapping of the remaining incisors.

In the last case a maxillary central incisor was broken and extracted in November, 1927, when the boy was eleven years old (Figs. 7 and 8). A mandibular incisor was extracted by the school dentist simultaneously to compensate for this, and the gap in the maxilla slowly closed until it was about 3 mm. wide,

when it remained stationary—the three mandibular incisors meantime had become badly imbricated. Finally a second mandibular incisor was extracted three years later in September, 1930, with the result that in the ensuing eighteen months the gap practically closed. At the boy's last visit the gap had quite closed and there was so far no overlapping of the remaining incisors—that remains to be seen!

In this case, as in the others, there is considerable narrowing of both arches anteriorly, maximal across the intercanine diameter, affecting all the posterior teeth to a steadily diminishing extent. Actually the intercanine collapse is almost the same as the width of the gap in each jaw. There is also a small (1 mm.) backward displacement of the incisors.

Now I will show you some late results of this form of treatment (Figs. 9 to 13). I cannot say what the original condition was, and the patients can only tell me that they had teeth extracted because there were too many. You will notice the backward inclination of the incisors, the mesial inclination of the

canines and their mesiodistal rotation, but most particularly the marked crowding of the remaining incisors and the V-shaped arch. In two cases two incisors have been extracted. [N.B.—The maxilla looks best in two cases in which maxillary incisors have also been lost.]

Fig. 9, models separated to show mandibular incisors, which would otherwise be concealed owing to close bite. Fig. 10, ditto, backward slope of incisors best shown in lateral models. Fig. 11, ditto, well shown. Fig. 12, rotation of canines; $\overline{1 \mid 1}$ gone. Fig. 13, ditto.

From the foregoing cases it would appear to be fair to conclude that if the collapse of the mandibular arch both laterally and anteroposteriorly is not going to matter in any particular case, and if the resulting contraction of the incisor region of the maxilla is also no disadvantage, then this method of treatment is legitimate and may be the best.

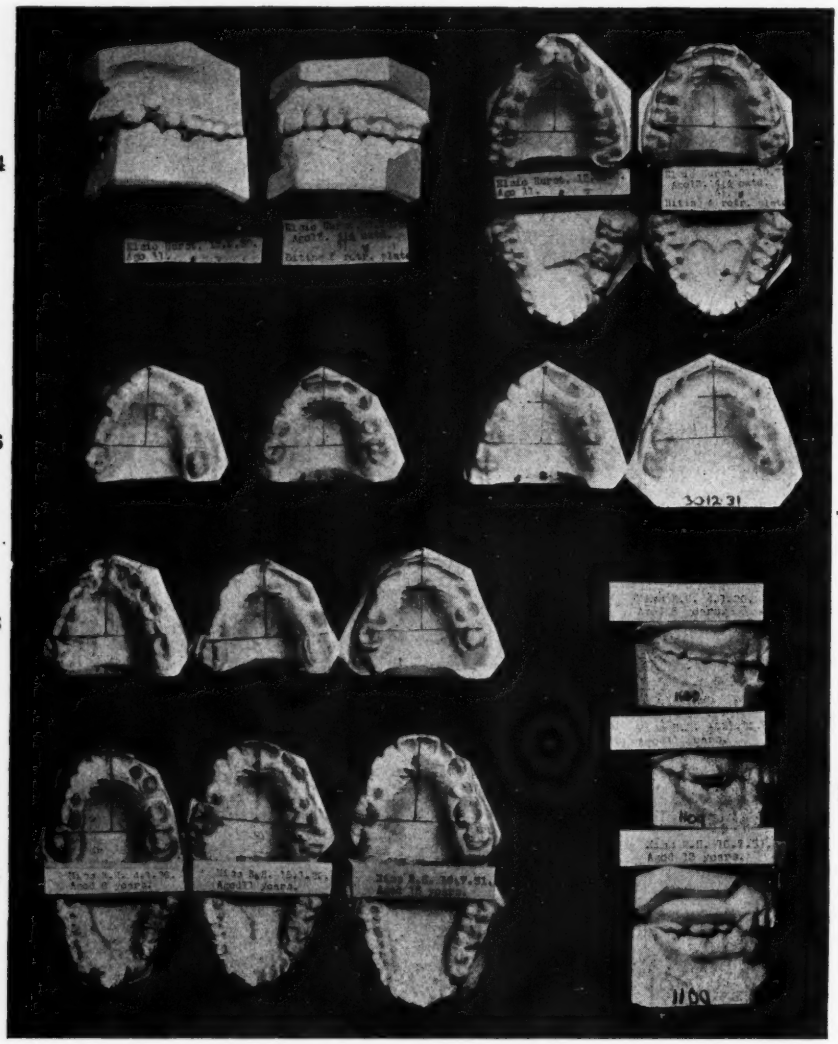
The next group of cases to which I want to draw your attention is Angle's Class II, Division 1, treated by extraction of $\underline{4 \mid 4}$, allowing $\underline{3 \mid 3}$ to fall back, and retracting incisors. Figs. 14 and 15 represent a typical case—pseudonormal owing to premature extraction of deciduous mandibular molars. It is of course a commonplace that if a retainer is not worn the second premolar and first molar will drift forward until the spaces are obliterated, and the patient will be no better off in appearance than before, and worse in function. It is, however, considered good practice to extract the $\underline{4 \mid 4}$ and insert a plate or arch to retract the incisors, and it is generally understood that in this case the molar and premolar together will give adequate anchorage and will not move forward much during the time required for the incisor retraction. I have more than once been disappointed by the small improvement produced by a quite considerable retraction of incisors, and decided to measure a few cases so treated.

In arriving at the movement of the incisors and molars relative to the arches as a whole, I found it unsafe to choose any teeth in either jaw as fixed points, and was driven to the expedient of selecting a characteristic point in the rugae—usually the first or second pair of lateral ridges or the small papillae between them. Anything farther forward than this was liable to be compressed anteroposteriorly by the movement of the incisors (Fig. 15). This convention may be unsound, and the whole of my measurements may be invalidated, but I know of no other available method.

The first few cases were taken from the records of the practice in which I am a partner. These were all treated by fixed appliances consisting of a maxillary arch sliding in tubes on molar bands, with cleats hooking under the morsal edges of the incisors to prevent tilting upward of the arch and consequent rocking forward of the anchor teeth. The only movement of the molars and premolars allowed by this appliance is a bodily translation forward of the roots through the bone. Traction was exerted by elastic bands. Here are a few cases so treated.

Case 1.—Treatment was commenced by extraction of $\underline{4 \mid 4}$ (Fig. 16), the arch was inserted immediately, and the gaps between the erupting canines and

the erupting second premolars were reduced from 8 mm. to 2 mm. in a year. The projecting central incisors were brought back farther until they were in good position. Actually what happened was the forward movement of the $\frac{6|6}{}$ by 3 mm. and a backward movement of the incisors by the same amount, so that the overjet of the maxillary incisors was only corrected by half. The method of measurement was to rule lines on a piece of celluloid (see Fig. 16). The short




transverse line was applied over a fixed point on the rugae and the sagittal line made to correspond with the median raphe. Actually the short transverse bisected the other line, but that is not an essential point. For photographic purposes I made two or three identical celluloid scales so that I could photograph them simultaneously.

Case 2.—The models in Fig. 17 show the same thing. The molar incisor interval was here lessened by 9 mm.—nearly a centimeter—the forward movement of molars and premolars accounting for 4.5 mm.

CASE 3.—The next case (Fig. 18) is interesting in that the first appliance was a removable biting plate with retraction arch attached. Nearly 5 mm. reduction of the molar incisor distance was obtained, and again about half was due to the forward movement of the molars. A fixed appliance was then used and a further 3 mm. reduction obtained, again half at the expense of molar movement. This case prompted me to investigate a number of hospital cases treated by plates. The results of some of these I shall show later.

CASE 4.—Figs. 19 and 20 show a Class II case in which an attempt was made first to treat by expanding the jaws, followed by raising and jumping the bite. This method proved unsatisfactory, and the $\underline{4 \mid 4}$ were extracted and a fixed retraction arch was fitted. Seven months later the $\underline{\mid 1}$ was extracted. In the series of models shown I have selected the earliest pair showing the untreated case; then, omitting the period of expansion, a pair after the arches had been allowed to collapse, and the $\underline{4 \mid 4}$ had been extracted for eight months; finally again showing the finished case two and a half years after the loss of $\overline{\mid 1}$.

A comparison of the first two pairs shows that the expansion had collapsed completely—the intermolar diameters are exactly the same. The mandibular incisors are much improved in alignment, but as the intercanine measurement of the permanent canines is actually slightly less than that of the deciduous canines, it would be rash to say that the improvement in the incisors could not have come about naturally. I mention this point here because it has a bearing on what I shall say in connection with another group of cases. The incisor molar distance has been reduced 2 mm., but although retraction had been in progress for six months, there is no measurable reduction in the distance between the central incisors and a given point on the palate, and the molars have come forward practically 2 mm. in relation to the same fixed point.

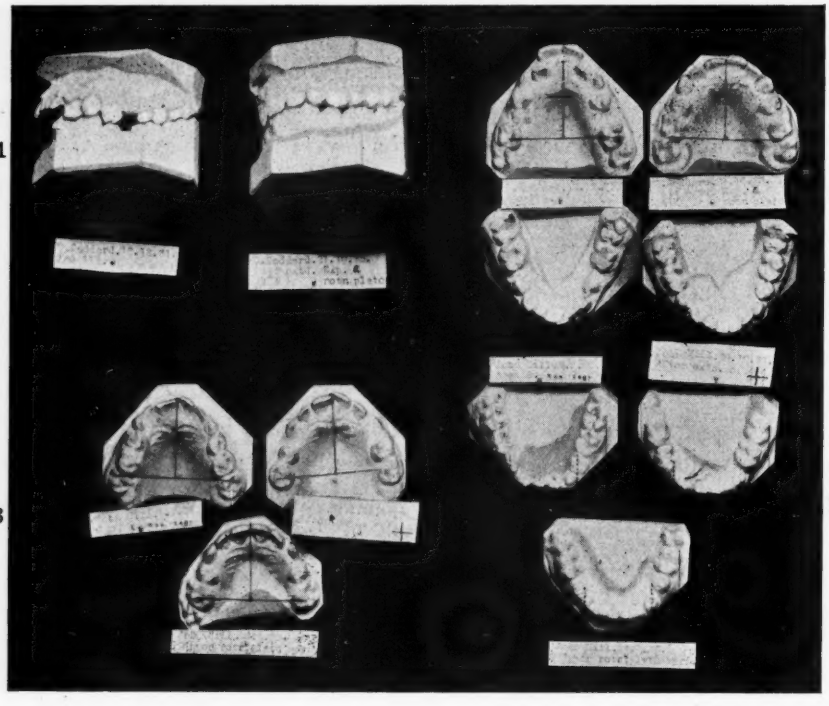
Now comparing the last pair of models with the earlier ones, the intermolar width is slightly reduced—0.5 mm. maxillary and 0.9 mm. mandibular, and the interpremolar $\frac{(5 \mid 5)}{4 \mid 4}$ width nearly 2 mm. (1.9) in both jaws. The intercanine diameter in the maxilla is only reduced by ⅓ mm., though the corresponding reduction in the mandible consequent on the loss of $\overline{\mid 1}$ is 3 mm. The only reason I can find for this is the fact that the maxillary canines are now in contact with and kept out by the buccal surfaces of the $\overline{4 \mid 4}$, whereas in 1929 they were anterior to them and in contact with the $\overline{3 \mid 3}$. Further retraction has reduced the incisor molar interval by 2.5 mm., of which the incisor movement accounts for another 0.5 mm. and the molar movement for the remainder.

The net result of treatment therefore is that the incisors have been brought back by about 0.5 mm. and the molars forward by about 4.5 mm. The irregularity of the mandibular incisor has been made inconspicuous and the arches as a whole have been slightly narrowed, especially anteriorly. The incisor overjet has been reduced just over 1 mm., so the appearance is distinctly improved—this may perhaps be put down to the credit of the mandibular appliance for advancing the incisors.

I have analyzed this case rather fully, as it throws light on the effect of the extraction of a mandibular incisor as well as of maxillary premolars and retrac-

tion of incisors, and incidentally it illustrates a point to which I wish to refer, the complete collapse in some cases of expansion undertaken as early as seven to eight years of age.

Now here are a few cases treated at the Royal Dental Hospital by extraction of premolars and retraction of the incisors by removable appliances. These consist in every case of a vulcanite plate covering the palate except just behind the incisors, and a wire arch attached to the molar cribs, with W bends to provide the necessary spring. Where necessary the canines are retracted first by fitting them with bands and hooks and retracting them with elastic bands attached to hooks on the cribs of the plate.




E. H., Figs. 14 and 15. In this case $\frac{4\,|\,4}{4\,|}$ were extracted and $\overline{|\,4}$ left, and I should like you to notice that the $\overline{|\,5}$ has found room to erupt. No expansion was carried out, but the $\underline{3\,|\,3}$ were retracted first and the bite was raised. The incisors were then retracted by another plate. The slide shows how the molars have moved forward to about the same extent as the $\underline{1\,|\,1}$ have moved back, in spite of the retaining effect of a plate fitting over the palate combined with cribs on the molars.

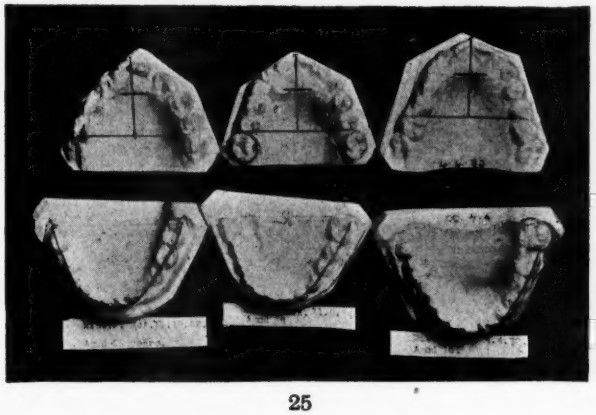
G. G., Figs. 21 and 22. This case is almost exactly similar, but here some expansion was necessary to make room to retract the $\underline{1\,|\,1}$. Then $\frac{4\,|\,4}{4\,|\,4}$ were extracted and the case was completed by retraction of $\underline{3\,|\,3}$ and later $\underline{1\,|\,1}$. Here again the molars have moved as much forward as the incisors have back.

Other cases are similar. I will show only one more. This boy (Figs. 23, 24, 29, and 30) had an open-bite and a history of thumb sucking. My decision

to extract $\frac{4|4}{4|4}$ was due to the hope that the incisors would pivot downward and backward about their apices, thereby reducing the open-bite. This did occur, but at the moment I want to show only that the molars have moved forward as much as the incisors have moved back. The incisors were retracted as part of the process of straightening them, and closing the gaps caused by the loss of the premolars.

Fig. 24 shows not only the reduction in the incisor molar interval, due presumably to the roughly equal movement of molars and incisors since the molar occlusion remained normal throughout, but also the maintenance of the intercanine width as contrasted with the probable result of extracting an incisor. The intermolar diameter is very slightly diminished.

This brings me to another question—namely, that of the natural growth of the arches. I have found in measuring models that a slight reduction in the various diameters is almost the rule following treatment by extraction, the posi-



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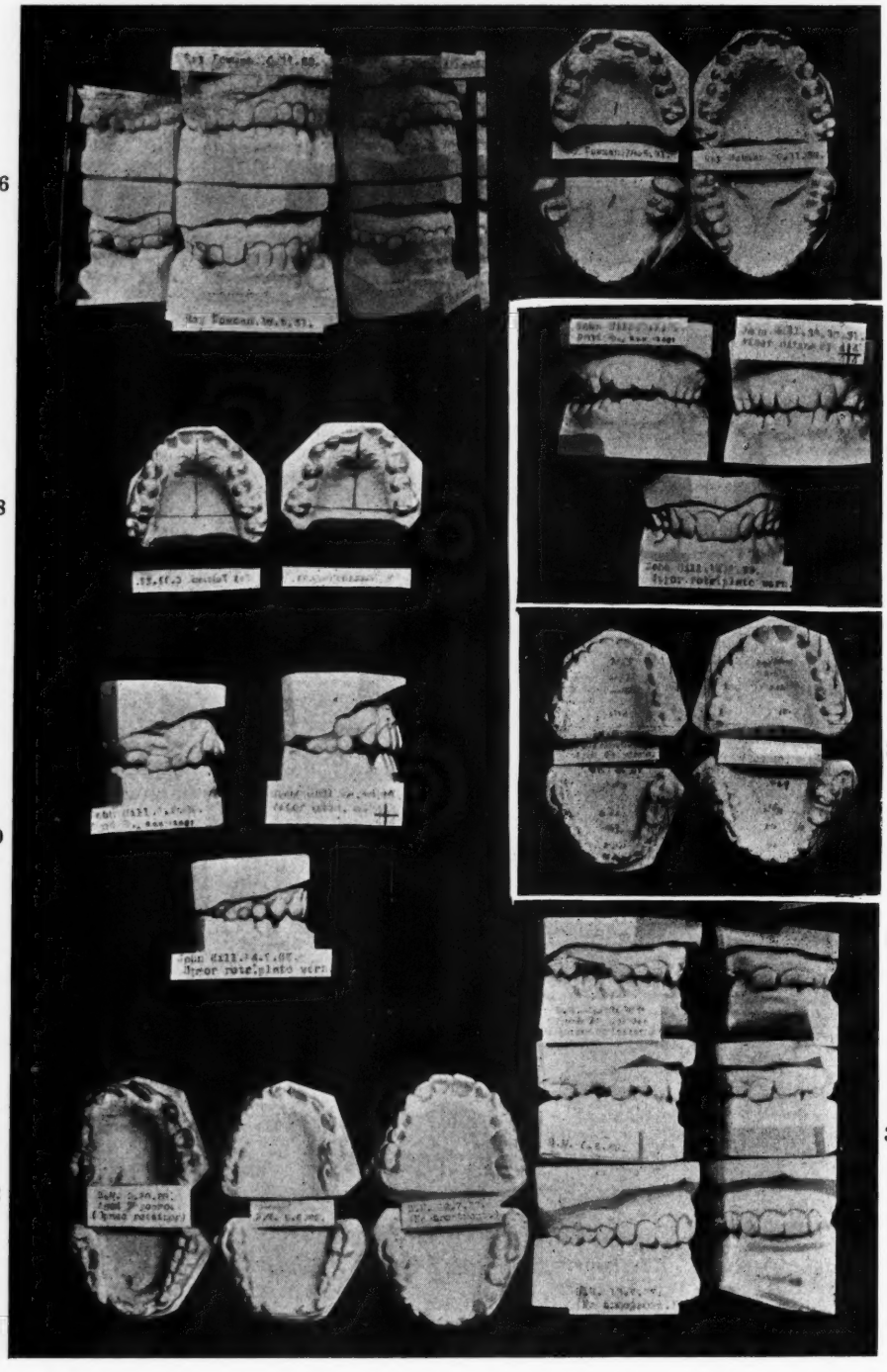
tion of maximum reduction varying with the tooth or teeth lost; but I have also found that quite commonly, especially in the mandible, there is a slight loss of width in cases that have received no treatment or have been treated by expansion without extraction. You have seen one or two cases treated by extraction in which width has been lost; Fig. 25 shows a case which was treated by expansion of both arches, combined with advancement of all the incisors.

As you can see from the position of the black line, there has been a relapse, complete in the mandible and practically complete in the maxilla, in the course of six years. The twisted mandibular incisors and the imbricated maxillary central incisors are as bad as ever, and there has been a definite reduction in the width of both arches; and you will notice that the maxillary molars have come forward long after the replacement of deciduous molars by premolars, although no teeth have been extracted. It is not difficult to multiply such cases, although I have shown only one example.

Now the obvious retort to this jeremiad is that it is a matter of common experience that many cases of crowding treated by expansion, especially if commenced at an early age, do very well indeed and are permanently rectified. I

am not prepared to deny the truth of this, but I would at least suggest that *post hoc ergo propter hoc* is a fallacy that may obtain in orthodontics as well as




in other spheres. The growth might have occurred in any case. May I as a final point elaborate this by showing a few assorted cases.

In Fig. 26 is shown a case of unilateral lingual incisor occlusion with insufficient space in the premolar region on both sides. The lingual incisor oc-

clusion was dealt with by means of a plate with screws bearing on the left maxillary central and lateral incisors. It was intended to treat the crowding later on by extracting premolars. You can see from the mirror reflections that these premolars are still there and there is no longer any crowding.

The occlusal view (Fig. 27) shows this more clearly. Now on the left side the pushing forward of the incisors has allowed the canine and a first premolar to come forward and so released the impacted $\underline{|5}$ so that treatment has cured the condition. On the right, however, there has been no treatment except the presence of a plate which would tend to splint the teeth in place. Here, however, the crowding was at least as great, and yet it has cured itself; the space between lateral incisor and the premolar is obviously greater. Fig. 28 seems to show that it is due to growth in the incisor region since the molars have remained stationary.

I showed a case earlier (Figs. 23, 24, 29, and 30) of open-bite treated by extraction of $\frac{4|4}{4|4}$ with an excellent result. I should have put this to the credit of the extractions but for the fact that the boy did not come for treatment for over a year after the first visit, and in the interval the open-bite had almost closed without treatment.

In Fig. 31 is shown the case of a boy whose parents were worried because the mandibular incisors appeared crowded. I advised waiting, and made models and measurements. In three and a half years the teeth had straightened themselves and the various measurements were considerably increased in both directions.

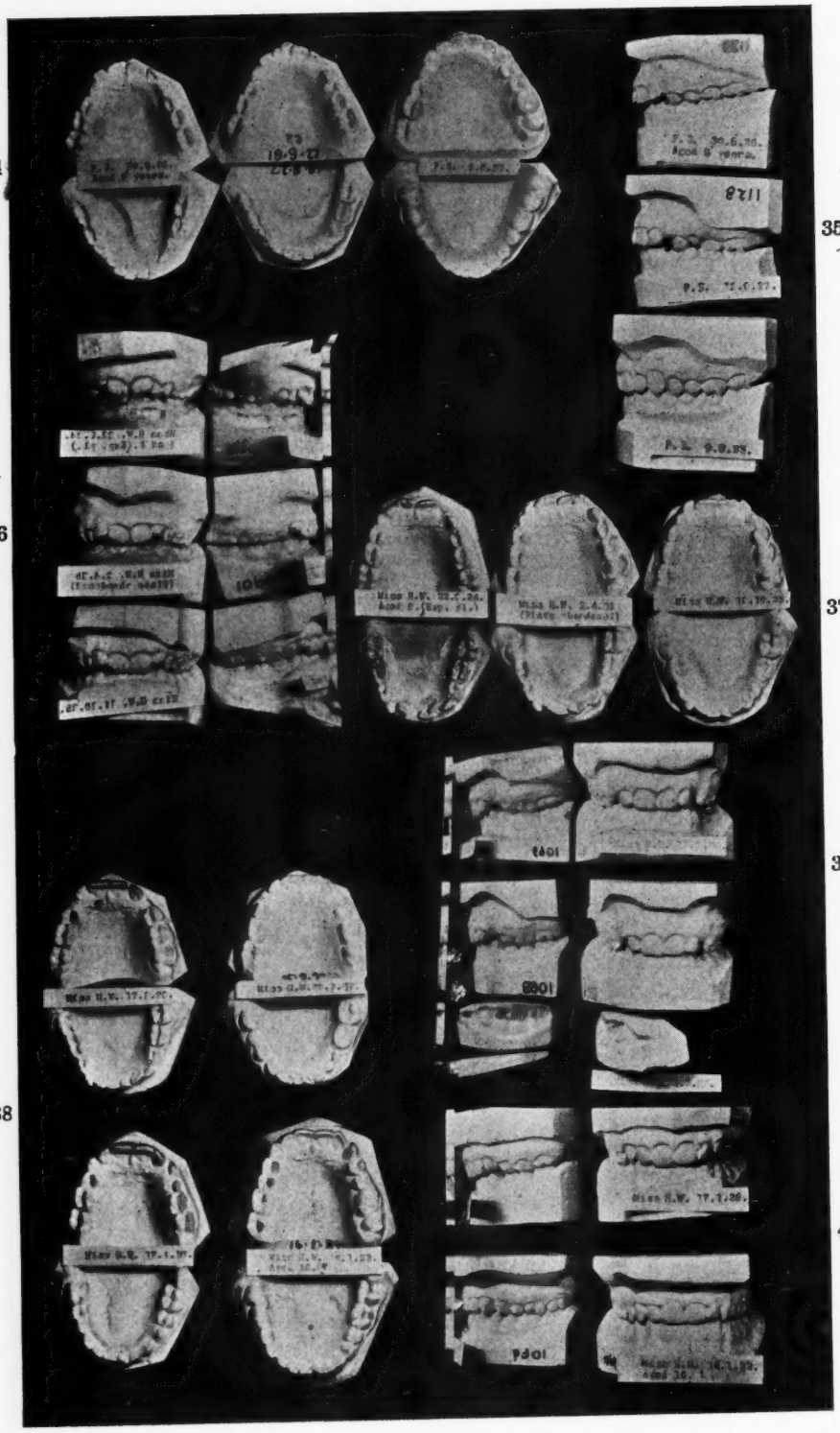
| | | | |
|---|---|---|---|
| Intercanine | Maxillary | 3.50—3.81 | Increase 0.31 cm. |
| Intercanine | Mandibular | 2.83—3.03 | Increase 0.2 cm. |
| First Deciduous Molars | Maxillary | 4.27—4.52 | Increase 0.25 cm. |
| First Deciduous Molars | Mandibular | 3.67—3.67 | Increase — cm. |
| Second Deciduous Molars | Maxillary | 4.85—5.12 | Increase 0.27 cm. |
| Second Deciduous Molars | Mandibular | 4.53—4.71 | Increase 0.18 cm. |
| Permanent Molars | Maxillary | 5.45—5.71 | Increase 0.26 cm. |
| Permanent Molars | Mandibular | 5.18—5.48 | Increase 0.3 cm. |

If I had expanded the arches at the age of six and one-half or seven years, the expansion would have been permanent, of course, and I should have had all the credit.

The next case (Figs. 32 and 33) is one showing unsightly irregularity of the incisors and apparently insufficient space in the maxillary premolar region. The only treatment was the wearing of a space retainer for a few months following the extraction of a septic deciduous molar. The plate was abandoned directly the second premolar began to appear and while there was still a gap in front of it.

This case threatened to be postnormal also. The second deciduous mandibular molars are not yet lost, but it is obvious that it will end as a case of normal occlusion with very little incisor irregularity, and that is hereditary in this case.

In Fig. 34 is shown a case of threatened Class II, Division 1, with the mandibular incisors biting against the gingival margin of the maxillary incisors. I warned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the parents that I should probably have to raise the bite, but the boy left the country for a year, and on his next visit had so much improved that I decided to wait. I have not shown measurements on the models, but the intermolar diameter increased in the maxilla 1.5 mm. and in the mandible 1 mm. between 1926 and 1933. Fig. 35 shows how the occlusion finally righted itself. This boy had a narrow escape from being an orthodontic success.

Last I will show a similar but even more striking case (Figs. 36 to 40). Fig. 36 shows a threatened Class II case with overlapping of the incisors in both jaws. This, by the way, is the sister of the patient before last, so that the position of the $\underline{1}|$ is hereditary. An expansion plate was worn for a short time and then abandoned, and the width gained relapsed completely. The successive models show the gradual decrease in crowding, though the occlusion remains the same. By the end of 1925 the case appeared to be definitely a Class II, Division 2, with the typical proclination of lateral incisors and retroclination of central incisors. As the child was a relation of mine, I was able to take models when I liked. I took fourteen pairs in all. These are a few of the more representative of them. The incisors are gradually straightening themselves until the arches are practically perfect, except for $|\overline{1}$ (Fig. 38). This also is an hereditary abnormality. The occlusion up to the age of eleven and one-half years is still postnormal, and a squeeze bite taken in 1927 confirms that the models are correctly articulated (Fig. 39).

Now if you will compare the last two models (Fig. 40) closely, you will see that the occlusion has become definitely Class I, between 1928 and 1932. In the first the relation of the canines is definitely postnormal, in the second the position is reversed.

I have no conclusions to draw from these cases, unless it be the rather depressing one that among cases treated early, the successful ones are those in which bone growth was destined to occur, and the unsuccessful ones those in which for some reason there is little or no bone growth. I must admit that I grow very tired of hearing orthodontists speak confidently of "stimulating bone growth by the insertion of an appliance," when, so far as I am aware, there is no scientific or experimental justification for such an assumption. Also, I believe that an orthodontist is essentially an opportunist and should not allow himself to be trapped into treating cases according to an imperfect classification; but I have presented these cases mainly in the hope of hearing what conclusions will be drawn from them by those of greater experience than myself.

(The author regrets the vagueness of some of the illustrations reproduced from the slides, unavoidably the same size; the slides showed clear enough on the screen.)

DISCUSSION

*Mr. Harold Chapman* said the only complaint he had to make about the paper was that Mr. Ainsworth had given so much in it that it was difficult to deal with all the points he had raised. Needless to say, the cases showing the loss of incisors were deeply interesting to him, but he was not sure that Mr. Ainsworth was happy with some of the results. [*Mr. Ainsworth:* "Very few."] He was not at all convinced that the loss of an incisor was any good in any one of the cases, though he had not had an opportunity of studying them very carefully. But he thought he was led to say that incisors should not be removed, and he

was glad the lecturer had found cases which, years after completion of treatment, emphasize that point. Although his own experience of this treatment was small, the result was similar.

The next series of cases dealt with the loss of first maxillary premolars and subsequent retraction of the maxillary incisors. The impression he had was that it had been argued in the Society that the incisors could be brought back without the maxillary premolars and molars moving forward when the latter were used for anchorage. He was glad Mr. Ainsworth had done what he (the speaker) had hesitated to do. Mr. Chapman illustrated, by means of a diagram on the blackboard, that if the mandibular arch is one cusp postnormal and it is desired to retract the maxillary anterior teeth into correct relations with the mandibular anterior teeth, the maxillary posterior teeth must not be used as anchorage for that purpose because they would inevitably move forward and preclude the possibility of putting $\underline{3|3}$ in the position of $\underline{4|4}$, an essential for successful treatment: the mandibular arch, by means of intermaxillary traction, must be used for anchorage. However, if the postnormality is less than one cusp, the maxillary cheek teeth may be used for anchorage so long as they do not move farther forward than corresponds to postnormality of the mandibular to the maxillary arch of one cusp: if, when this occlusal relationship is reached, further retraction is necessary, intermaxillary traction must be used for the purpose. These considerations apply when it is necessary to bring about normal relations of maxillary and mandibular incisors: for teaching purposes to view the problem in the manner described is very helpful. The use of celluloid sheets to show changes of position of teeth in relation to other teeth was extremely helpful. He thought they were all very deeply indebted to him for bringing to them cases which had obviously been watched in one practice for a large number of years. Such cases were extremely difficult to obtain, and for that reason he felt that the members very greatly appreciated what he had done that evening.

*Mr. Northcroft* said he would like to congratulate Mr. Ainsworth on the presentation of these various cases. Incidentally he wished to endorse every word that Mr. Chapman had said; he deprecated the bringing back of incisors against the anchorage of the 6 and 5. In his experience the 6 and 5 very frequently moved forward, and he thought Mr. Ainsworth had shown pretty clearly that it was about fifty-fifty, and they were bound to get that forward movement unless intermaxillary traction is used.

*Mr. Maxwell Stephens* said it just occured to him to ask regarding the question of the open-bite whether Mr. Ainsworth had obtained any record of the giving up of the habit of pressure of the lips by thumb sucking and its effect on the incisors. He thought that what Mr. Northcroft suggested in regard to the last case was reasonable.

The *President* thanked Mr. Ainsworth on behalf of the Society for bringing forward his valuable paper and for his contribution of ideas. He would like to ask for something a little more definite about the celluloid strip, for he felt there might be some error of parallax in placing the mark. He thought Mr. Chapman had agreed with what he said in his Presidential address as to the extraction of a lateral incisor, but it had been found to be a good expedient at times and the result was quite pleasing. He had a very intelligent nurse who had been a mechanic in a workshop. One of her friends had a lateral incisor extracted, and she knew that friend two years before she discovered that she had lost a lateral incisor. What strength of wire did Mr. Ainsworth use for moving forward the molars, and was he definitely sure every time the patient made a visit that there was an upward spring on the hooks? The upward spring must be maintained so that the reaction tended to tilt the molars backward He suggested that if the ends of the bow wire were snipped off with cutters and left rough this would often stop movement, but if the ends were ground off with a stone, making them smooth so as to slide freely, in the buccal tubes, the case would go along nicely.

*Mr. Ainsworth*, in reply, thanked the members for their kind reception of his paper. There was little for him to reply to as there had been unexpectedly little opposition. With regard to the extraction of mandibular incisors, Mr. Chapman had spoken of poor results, and he agreed that so far as the effect of the loss of the incisor was concerned, they were poor results, though one or two of the ultimate results from the point of view of general appearance were satisfactory. As regards the retraction of maxillary incisors, Mr. Chap-

man agreed with the effect on the maxillary molars, that one did get the loss of available space; his exposition on the blackboard was valuable and gave a logical basis for selecting the procedure to be adopted. Mr. Northcroft had referred to the last two cases of spontaneous change from Class II to Class I, and his explanation, based on the opening of the bite by the second molars, was illuminating: he would keep his eyes open for further cases. Mr. Maxwell Stephens had asked if the case of open-bite treated at hospital gave a history of thumb sucking, and whether the habit was broken. He had no data on the last point, but there was a history of thumb sucking and he was prepared to concede a lot to that fact.

The President had spoken of the possibility of error in using celluloid sheets. There was the possibility. It was difficult to photograph two models together with celluloid superimposed in exactly the same way in each. He had photographed the models inside a tea chest, the floor was blackened, a door made at one side, and the camera pointed down through an aperture in the lid. To adjust the celluloid sheets, the model was placed beneath the hole, and moved about so that the selected points on it passed in turn vertically underneath the center of the hole, the corresponding lines on the celluloid were then made to coincide by adjusting the position of the celluloid accordingly. When the models to be compared were thus adjusted, they were placed side by side and tilted so that the surface of the celluloid was roughly at right angles to the line joining it to the camera lens, thus avoiding distortion. The President had referred to the loss of a maxillary lateral incisor in one case; it was the central incisor that had been lost and the mandibular central incisor was extracted on that account. It was precisely those cases which showed good results on extracting mandibular incisors; where a mandibular incisor had been extracted and not a maxillary incisor as well, the result was not so good. The retraction arch was given an upward spring as the President had said. In the case described at length there was a record that the arch had had to be abandoned for some time because the maxillary incisors had been shortened to a considerable extent, and that was fairly good proof that the arch was exerting upward pressure; forward movement of the molars occurred nevertheless.

# CASES IN PRACTICE*

H. E. Marsh, M.C., L.D.S., Bexhill, England

Case 1.—Angle's Class I. Underdevelopment at apical base area of premaxillas. Crowding of incisors in both jaws, with proclination of maxillary central incisors.

The before-treatment models were taken at age 15.2. The patient is a well-developed girl; the face is well proportioned, except in the front of the mouth. The teeth show a great deal. The upper lip is short. There is a flatness about and beneath the nasal alae, but the balance between the middle and lower thirds of the face, externally, is good.

The patient had been under treatment by means of removable plates for four years, when the models shown in Fig. 1 were taken.

The patient is of a temperament unsuitable for removable plates.

At age fifteen, her parents were in despair about her disfigurement. It was decided that the four first premolars must be extracted, and this was done at age 15.4.

At age 15.5, fixed appliances were instituted, and the patient was able to tolerate them. Treatment was directed to the rotation and retraction of the maxillary incisors and the backward movement of the canines, by means of a labial arch, Jackson's type of springs acting reciprocally between central and central and lateral and lateral, and by means of intermaxillary elastics. In the mandible a lingual arch was used with auxiliary springs for alignment of the left central and lateral incisor and the backward movement of the canines. Prolonged attempts were made to move the left second molars maxillary and mandibular, into occlusion, without success.

First, independently of the appliances anterior to these teeth, an intermaxillary elastic from the buccal of the maxillary to the lingual of the mandibular was used—ineffectively.

Later, small springs extending backward from the maxillary labial arch to the buccal of the maxillary molar and from the mandibular lingual arch to the lingual of the mandibular molar were used—also ineffectively.

Tooth movement proceeded from age 15.5 to age 16.0, and appliances were allowed to remain passive from age 16.0 to age 16.3.

At that age they were all removed and nothing was worn at all until age 16.9, when, owing to the degree of relapse having become somewhat formidable, the use of a removable night plate was found to be capable of being tolerated, and it is still in use, at age 18, and there has been no further relapse.

The models shown in Fig. 2 were made at age 16.9, when for six months no appliances had been in use.

*Transactions of British Society for the Study of Orthodontics, 1934.

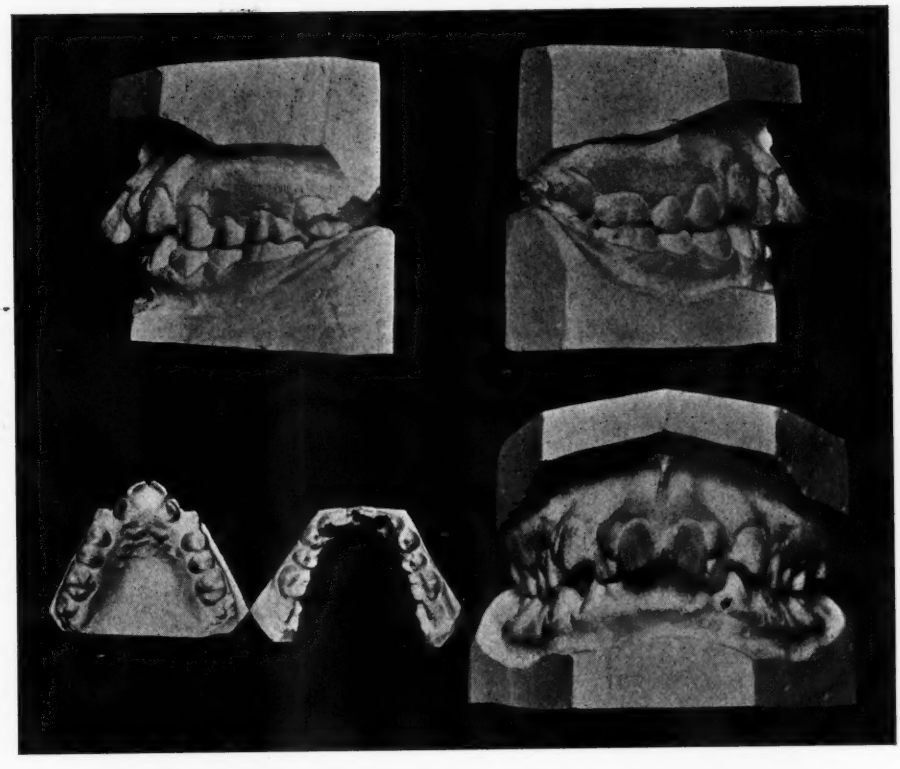

Fig. 1.—Before treatment.

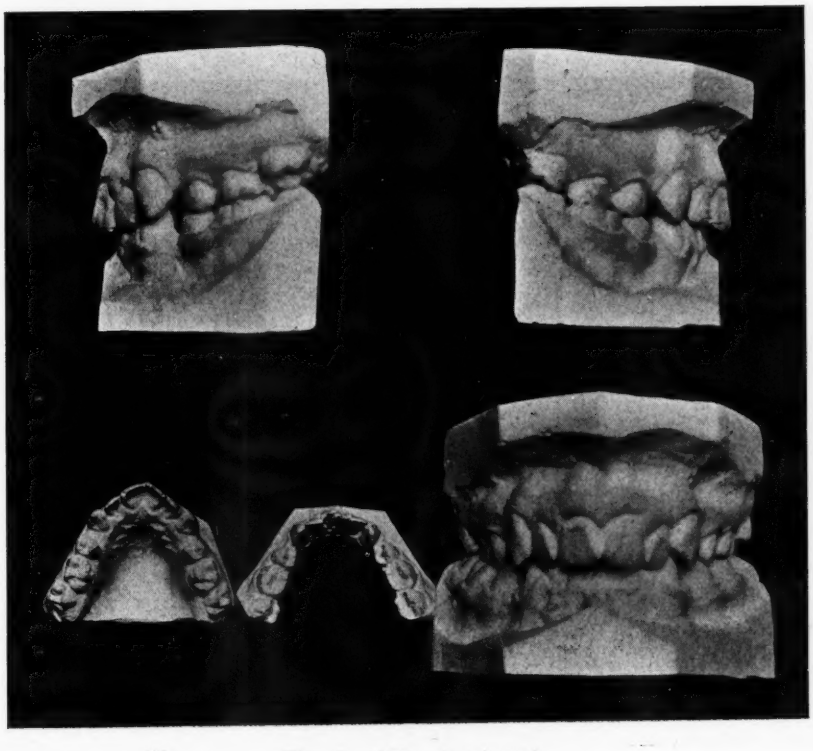

Fig. 2.—After treatment.

Fig. 3.—Patient at the age of eleven years.

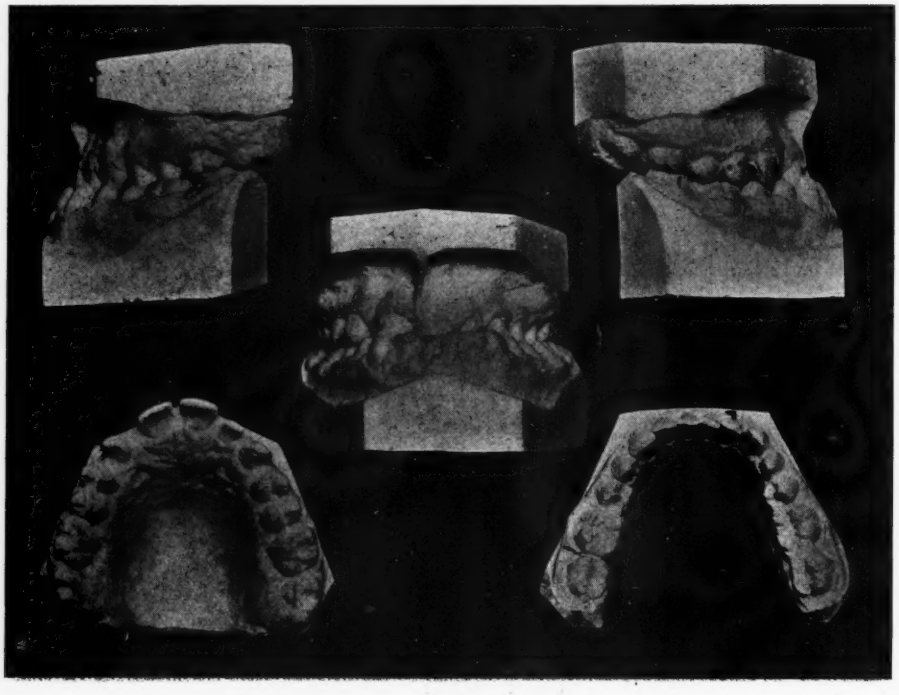

Fig. 4.—Models of patient at the age of seventeen years.

CASE 2.—Angle's Class III. A case of very marked disparity between the growth of the maxillary bones and that of the mandible.

The patient was first seen at age eleven years, when the incisor teeth were edge to edge in occlusion. At that age the chin was prominent.

The maxillary teeth were small and the right lateral incisor was totally absent. (Fig. 3.)

During the six years from eleven to seventeen years, efforts to keep the maxillary and mandibular arches in some sort of relation to one another have been in progress.

The maxillary arch has been expanded and, by means of intermaxillary elastics, the maxillary teeth have been moved forward and the mandibular teeth backward.

Also for two years a head and chin cap with elastics has been worn at night.

In spite of these measures, the mandible has continued to develop in a forward direction and the alveolar process and teeth have advanced to such a degree as Fig. 4 shows, where the maxillary first molars are in occlusion with the mandibular second molars, and the mandibular incisors bite in front of the maxillary incisors.

The patient is a very slightly built person in all other respects than the mandible, and is very sensitive about the matter, so much so that I was unable to obtain a photograph of her profile to show the meeting. I can obtain from her parents no history of a similar condition in any of her forebears, on either the father's or the mother's side.

DISCUSSION

*Mr. G. Northcroft* said that he was surprised that he did not mention, when the case came up for discussion before, the advisability of reducing the number of units in the mandible to make the size of the mandible more nearly correspond with the size of the maxilla, especially as there was a right maxillary lateral incisor missing. The rational treatment would have been to extract some teeth from the mandible, which was obviously too big for the maxilla, even after the expansion. If the child had been suffering from acromegaly, development could not very well have been arrested, but the rate of progress of the deformity would have been considerably slowed down and the child's appearance probably improved.

*Mr. J. H. Badcock* asked whether the pain which the first patient had suffered had not possibly been due to the treatment having been carried through somewhat rapidly for the patient's age. Another factor that might have contributed toward pain had been the elastic which had been carried from the maxillary canine to a mandibular molar. The canine would have been subjected not to a steady strain but to an intermittent strain which varied every time the patient opened her mouth. This would tend to make the tooth much more tender than would a continuous strain in one direction. He disclaimed any idea of criticizing the treatment, saying that he was merely asking for information. The second case, he suggested, might almost seem to be one for surgical intervention. The removal of teeth from the mandible was the first measure that occurred to him and might have been successful, but to judge from the photographs the jaw was developed to such an extent that mere removal of teeth would perhaps have allowed those that remained to tilt still further back, so that little advantage would have been gained. The case was almost serious enough for removal of a part of the jaw or for an incision across the base of the ascending ramus on either side and a backward displacement of the jaw.

*Mr. W. A. Bulleid,* in agreeing with Mr. Badcock's remarks, observed that the breast development was abnormal and that nothing short of surgical intervention could possibly improve the condition. He would have consulted Mr. Percy Cole, who would at once have been able to discuss the possibilities. Further reduction in the size of the alveolus would simply accentuate the extraordinary projection of the mental process and make the patient's appearance worse than it was at present.

*Mr. H. Chapman* described Mr. Marsh's communication as a valuable lesson. He was, he said, extremely interested to hear that Mr. Marsh had used the chin cap and head net, although these appliances had unfortunately not been successful. He himself had used them a number of times recently and had been gratified with the results, but his patients had not been so old nor the cases so difficult. He had found the method a useful adjunct during the last few years, though until eight years ago he had never used it.

*Mr. H. G. Watkin* remarked that Mr. Marsh had mentioned some relapse in the maxilla between the canine and the second premolar. He might have found it of advantage to take the second premolar from the mandible instead of the first. The occlusion would then have been definitely more normal and the gaps might have been less pronounced. He agreed with other speakers that in the second case surgical interference was the only suitable treatment.

*Mr. N. J. Ainsworth* said that he was not quite clear whether in the slide showing an occlusal view of the first case on completion there had appeared any improvement in the mandible as a result of the extraction of the first premolars. He expressed a desire to see the slides before and after treatment consecutively. His impression was that there was little more imbrication in the incisors of the mandible before than after the case had been completed; in other words, the mandible did not appear to have been improved. He wondered whether it would have been possible to treat the case by the extraction of the maxillary premolars alone, or whether he had overlooked some point which made the extraction of the mandibular premolars essential.

*Mr. Cutler* suggested that Mr. Marsh shared with another distinguished Sussex practitioner —Mr. H. C. Visick—the peculiarity of extreme modesty. When these gentlemen came to show the Society their valuable cases, they always demonstrated cases which they considered to be failures. Members were perfectly well aware that they had thousands of successes; it was only necessary to go down to Eastbourne or Bexhill to hear of the good repute of Mr. Marsh and Mr. Visick. He asked whether, when the backward movement of the canine was called for in patients over fourteen years, Mr. Marsh made a great point of immediate backward force on those teeth. He preferred himself to exercise retraction within a week of the extraction of the first premolar, using a moderate degree of traction in a backward direction on the canine; and not to leave this operation for a month and then have to use greater force. The second case offered, he said, an interesting point of differential diagnosis between the two quite distinct groups of cases in which the mandibular teeth bit outside the maxillary ones. In Angle Class III cases there was overgrowth in the mandible, and in another group the mandible was virtually normal and the maxilla, although more or less equal in bulk to the mandible, was wrong in shape, being shorter from front to back. At the age of six or seven years both classes had the same appearance of the maxillary front teeth biting inside the mandibular front teeth, and the question of prognosis—the expectation of treatment—was a very important one. Cases in which the maxilla tended to be short from front to back, associated with a normal mandible, invariably did exceptionally well; they worked like a charm; the condition was absolutely stable and the result was marvelous, and everybody was delighted. Class III cases invariably went badly, as Mr. Marsh had shown that evening. There were many points in the differential diagnosis. History was one; the other was the characteristic shape of the mandible. In cases where the maxilla was slightly short from front to back the mandible was roughly of the shape illustrated in the first diagram, with a fairly square angle. A Class III mandible had a very open angle, as shown in the second diagram, and these cases invariably had a bad prognosis. The Honorary Secretary said

that he had treated a case of a child of two and one-half years with a chin cap and bandage, and it had done very well, though he did not know how it would go in the future. He believed that in acromegaly the teeth were separated on account of interstitial growth of bone.

*Mr. Marsh* replied that he had had the advantage of Mr. Chapman's opinion when he had first seen the case, and his colleague had agreed that the extraction of one or both mandibular first premolars might tend to emphasize the prominence of the chin when the arch closed up. He still believed that it was possible that the extraction of one or more mandibular teeth would have been better, but they had decided otherwise at the time. In using the word pain he had possibly not chosen a good expression; there had undoubtedly been pain in the rotation of the lateral and central incisors, but not very severe. What he had referred to had been the intense stress upon the patient's nervous system as a whole. He had known nothing about the removable appliances; the child had been brought to him at the age of fifteen and he had been told that she had had dozens of plates. Her parents had tried every possible means of getting her to wear them; she was a highly sensitive only child and badly spoiled, with far more personality than either of her parents, and had been completely in control of the whole family of three. The fitting of the bands had been—he assured the meeting—a kind of "thunder over Mexico." He agreed that surgical interference was the treatment now required for the second case, and said that he had spoken to the parents about it. They lived in Cheshire, so it would not be very far for them to go to see Mr. Watkin, when possibly the Society might hear of another graphic case like the one which their former president had done for Mr. Simpson some years before. Mr. Watkin was right, he thought, in suggesting the extraction of the second premolars instead of the first.

Mr. Ainsworth who had suggested that the extraction of the mandibular premolars was not necessary and that the case might not really be in Class I might be correct. Mr. Marsh invited him to inspect the models and to say whether he thought there had been any improvement in the mandible.

He had strong views, he declared, on the subject of starting to move the canines backward into their sockets within a week of extraction. He had once extracted two mandibular premolars and started to exert force on the canines about four days after the extractions had been done. The appliances had been fitted and the springs set to work. He had not been using elastics, but finger springs from a lingual arch. The parents had rung up about nine miles from his residence, and he had had to go out to see the child; she had had a tremendous swelling on the right side of the mandible and a temperature of 103°, with tenderness of the lower border of the mandible, and he had not been sure whether she had an acute glandular infection. He had removed the appliance and the next day the temperature had sunk to normal and the swelling had begun to go down, and recovery had been swift. He had always afterward believed it to be bad to start pulling canines back into sockets which were no more than wounds. The child had possibly got an infection in the socket and the condition might have had no connection with the pressure, but he had been frightened by the case and had never done the same thing again, but always now waited six weeks.

He promised to bear in mind Mr. Cutler's diagnostic point concerning the shape of the mandible and its significance for prognosis.

# ORTHODONTICS AS AN AID TO THE RHINOLOGIST*

ARCHIE B. BRUSSE, D.D.S., DENVER, COLO.

THE size and shape of the nasopharyngeal cavity are determined to a great extent by the form of the surrounding bony structure. In Bacher's[1] study of the evolution of the human face he states that "often the nasal septum, unable to accommodate its height to the practically unyielding floor and roof, follows the lines of least resistance and buckles."

Schuller[2] of Vienna shows that anomalies of the shape and size of the epipharynx arise through congenital or acquired deformities of the base of the skull. He cites a number of cases of shortening of the vertical diameter caused by the change in shape of the cranial base. An eight-year-old boy had been under rhinologic treatment since early infancy because of difficult nasal respiration. Adenoids was first thought of as the cause of the obstruction, and repeated adenoidectomies failed to give any relief. Roentgenologic examination of the nasopharynx was made. The film showed an abnormality of the shape of the cranial base. The deformity of the nasopharyngeal cavity as a result of this was of such a degree that there was absolutely no air space between the nasal cavity and the nasopharynx.

It is natural for the orthodontist to assume that the reverse is true, i.e., anomalies of shape and size of the nasopharyngeal cavity arise through congenital or acquired deformities of the maxillary arch causing impingement of the structures lying between the two fixed planes, the cerebral fossa above and the roof of the mouth below. Especially is this true of the high narrow maxillary arch of the mouth-breathing type.

In the cases reported by Schuller of impaired breathing the patients had received the usual rhinologic treatment for several years before it was discovered that the deformity of the base of the skull was the cause.

Is it not possible that the rhinologist is slighting the possibility of malocclusion as an attributing factor in many cases of mouth-breathing and sinusitis?

Review the history of your treated cases of extreme distoclusion with protruding maxillary incisors, short upper lips, mouth-breathers, and a general lack of muscle tone. Study the models and note the narrow maxilla and the mesiodistal relation of the arches. Extreme effort must be exerted to close the lips to effect normal breathing. Examine the models of the finished case. The arches have been expanded from one-half to three-quarters of an inch, and the distal relationship has been corrected, the final photograph shows the lips in contact without effort, and normal breathing established. Then ask yourself, "Are you an aid to rhinologic treatment?"

The rhinologist cannot correct mouth-breathing in cases of this type, and if abnormalities of this class are not treated orthodontically, proper aeration is lacking, with a possibility of later sinusitis.

*Presented to the American Board of Orthodontia.

It is universally agreed by rhinologists that the requisites for the preservation of healthy sinuses are proper aeration and ample drainage. The most that the sinusologists can hope for in the treatment of early sinus disease is to accomplish Nature's purpose by the simplest possible method, and that is to establish ventilation and drainage.

The orthodontist has been helping the aeration of the nose for years. He was unaware of this accomplishment, since all he was interested in was the malposition of the teeth.

Today there is a plea for more conservatism in sinus surgery. Dean[3] states, "We no longer look at a patient as one who must be operated upon; rather we are devoting all our efforts to remove the cause and produce a more desirable result, or we think of other procedures, radium, x-ray, ultraviolet ray, in our effort to secure for the patients the best possible result with the least danger." Dean does not mention orthodontia as an aid, nor can I find orthodontia mentioned in the literature of laryngology or rhinology.

Metzenbaum in describing his technic for correction of dislocation of the septal cartilage stresses the importance of correcting the deformity early rather than waiting until the nose is entirely developed. He further states that "I believe we should correct this type of nasal deformity at an earlier age than we have been used to doing in the past, as proper aeration should be established before the nose and sinuses have reached the height of their development."

Should these young patients be operated on or should orthodontia treatment be instituted?

Regardless of the lack of evidence, rhinologists insist that blows or falls are the common causes of earliest deflected septums. Mosher[4] says, "When the eruption of one central incisor is delayed, it causes a deformity or hypertrophy of the premaxillary wing above it. This results in septal distortion with a resultant convexity to the opposite side."

I have a case similiar to that reported by Mosher, which was successfully treated orthodontically. A boy of nine years presented extreme Class II, Division 1 malocclusion (Angle's classification). The maxillary right first incisor erupted two years before the left incisor. The child was a habitual mouth-breather, with a short upper lip and chronic sinusitis. The case was corrected with an Oliver progressive guide plane with finger springs for expansion. Mouth-breathing was corrected, and the boy was taught forced breathing through the nose. The physician in charge agrees that there is a marked improvement in the boy's sinus condition, which we attribute to aeration.

The rhinologists are perplexed with the problem of sinus infection which the following confession of A. W. Proetz[5] of St. Louis admits: "We know discouragingly little about sinuses, and only exert a feeble influence upon their welfare. We know, in a word, that a sinus is an air cavity communicating with the nose; that it is capable of infection and that when its ventilation and drainage are impaired trouble ensues. We know in a general way what are the symptoms of such infections and blockades, and too often we are mistaken even in these. We have devised dozens of more or less ingenious ways of opening these cavities all for one purpose—to let out infectious material; which sums up virtually the whole of sinus surgery, and cannot be considered a step

ahead of the elementary surgical principle of draining an abscess anywhere in the body, as practiced by the ancients. Our treatment plays a pathetic rôle in the process of repair which Nature institutes and effectively pursues. There are many exceedingly elementary matters about sinuses of which we know very little. To begin with, we do not know why they exist at all.''

The rhinologist acknowledges the difficulty in successfully treating sinus infections; and as aeration is a requirement for healthy sinus, it presents an opportunity for the orthodontist again to advance the thought that breathing spaces within the nose can be increased by correcting certain types of malocclusion. If orthodontists can present proof of this accomplishment, orthodontia will be welcomed as an adjunct to rhinologic practice.

I am presenting an old subject under new conditions. Teeth are now being moved in a different manner. The gentle pressures are almost physiologic in their action, and muscle function now plays an important rôle in treatment; and, if used as advocated by Homer B. Robison, proper aeration can be established, that is, proper functioning of the following muscles: levator labii and naris muscles, alien cartilage, and the muscles of the lips.

We can all report numerous cases showing improvement in oral and nasal functions, but the rhinologist will doubt our reasoning without positive proof.

I should like to have this paper act as a challenge for some one better equipped to establish the relationship of orthodontia to the specialties of otology, rhinology and laryngology.

## CONCLUSIONS

1. The surrounding bony structures form the size and shape of the nasal cavity.
2. The base of the skull and the roof of the mouth are unyielding, and the septum buckles.
3. The size and shape of the base of the skull causé deformities in the nasopharyngeal cavity which interfere with nasal respiration.
4. Anomalies in the shape of the roof of the mouth should cause deformities in the nasopharyngeal cavities.
5. Delayed eruption of one incisor causes premaxillary irregularity and septal deviation.
6. Aeration is a requisite for healthy sinuses.
7. Sinus infection presents a perplexing problem to the rhinologist.
8. Orthodontia treatment is indicated in many cases of sinusitis to correct mouth-breathing.

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6. Schaeffer: Development of the Human Palate.

# OPEN-BITE WITH OBTUSE MANDIBULAR ANGLE AND RELATIVELY SHORT RAMI, MATERIALLY IMPROVED BY EXTRACTION*

GEORGE R. MOORE, D.D.S., ANN ARBOR, MICH.

HISTORY.—The patient, a girl aged fifteen years and nine months, presented first in July, 1930. Her mother has normal teeth, normal arch relationship, and normal facial form. Her father, brother, and paternal uncle,

Fig. 1.

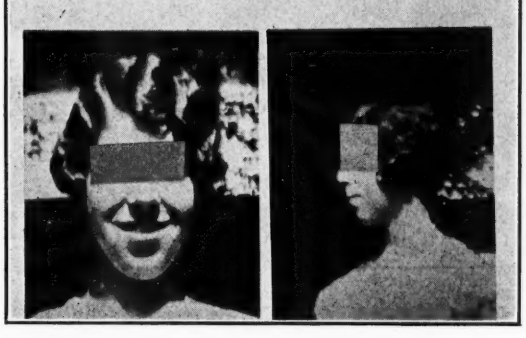


Fig. 2.

among other relatives, exhibit this same obtusity of mandibular angle with faces which are very much out of proportion when the nasion-subnasion measurement is compared with the subnasion-menton measurement; and yet among the four mentioned who possess this obtuse angle and long face, the patient is the only one with an open-bite. The father does not have a deep overbite, but all his teeth are in occlusion.

*Presented to the American Board of Orthodontia.

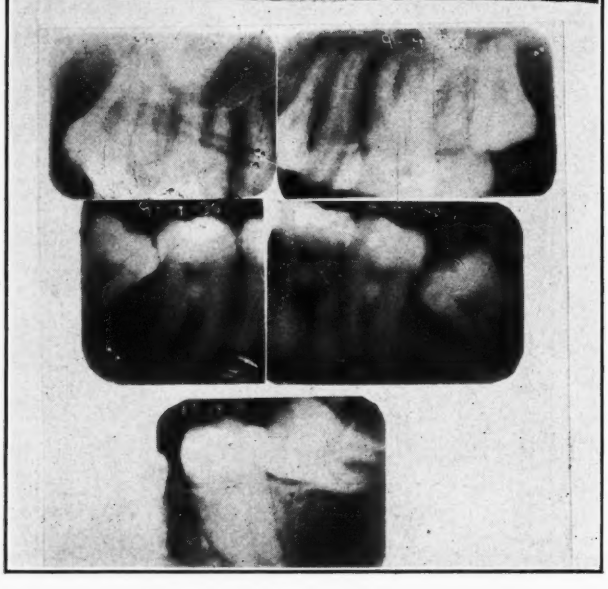
Fig. 1 is a profile of the patient in July, 1930. Fig. 2 shows front and profile views of the patient taken in 1928.

The mother reports for the patient a normal prenatal period, normal birth, and normal early infancy. She was artificially fed for one year. There were no pacifiers ever used, and there was no history of habits. Her nutrition was very closely watched by her parents. She has not been subject to respiratory infections.

Fig. 3.

Fig. 4.

Fig. 5.



*Etiology.*—After examining the photographs of the patient and her relatives, one is very much inclined to deduce that this condition of malocclusion may be attributed to hereditary factors. In spite of this factor, it is interesting to note that on account of environmental factors or other individual hereditary factors acting in one but not in the other, a similar heredity has produced in several relatives quite different occlusal manifestations.

*Diagnosis.*—Open-bite malocclusion, otherwise termed aclusion, of maxillary and mandibular anterior teeth, complicated by an abnormal growth factor in the development of upper and lower face.

*Treatment.*—Extraction of maxillary and mandibular right and left first permanent molars was resorted to in the treatment of this case, for two reasons: first, the operator was convinced that upper facial height and lower facial height were already extreme and that treatment according to accepted methods applied to cases of this type would do nothing but increase the appearance of facial length. A headgear might have been used, but favorable prognosis with its use was doubtful. There was, moreover, a marked protrusion of both maxillary and mandibular anterior teeth with definite indication of underdevelopment of both maxillary and mandibular apical bases. The second reason for resorting to extraction lay in the fact that, being a compromise treatment necessitating very little if any manipulation of appliances, this mode of treatment made possible

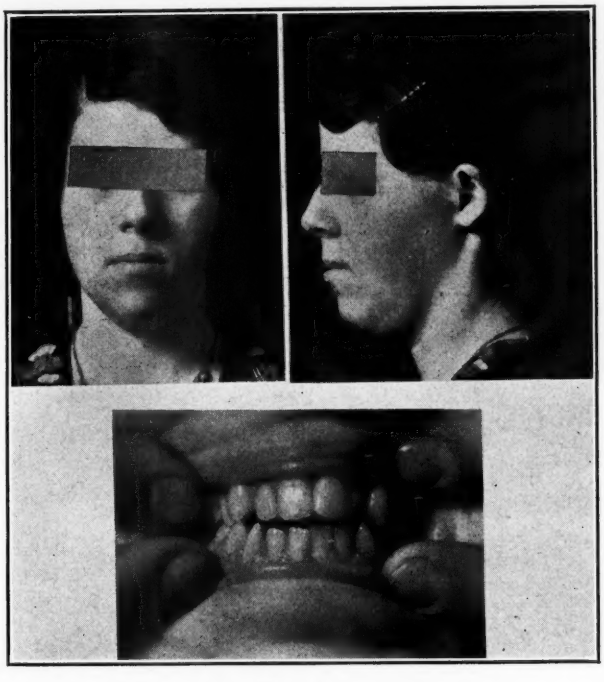


Fig. 6.

the improvement of a condition which, on account of finances, would never have been treated. First molars rather than second premolars were extracted because of the fact that second premolars in this case were perfectly sound and first molars had been subjected to considerable operative work.

*Results.*—Fig. 3 shows casts made Aug. 4, 1930, and Fig. 4 shows those made Dec. 28, 1931. Note the closure of first molar spaces which is in progress. In addition, note the proportionate closure of the bite and the more erect position of both maxillary and mandibular anterior teeth. There has, of course, been a little tipping of second molars, but so far it is my opinion that the improvement warrants the method used. Unfortunately, my radiographs are not complete in this report, but it will be seen in the bottom of Fig. 5 that the mandibular right second molar has tipped into a more upright position, appearing to relieve the third molar. Fig. 6 shows front and profile photographs taken in April, 1932.

*Prognosis.*—I believe that progress over the last two years following the extraction of the teeth guarantees a rather favorable prognosis. I have advised the orthodontic closure of spaces between premolars and molars and some corrective work on the anterior teeth at a later date when nature seems reluctant to improve further, but I am quite certain that this will never be done.

I am satisfied that in many cases of open-bite as severe as this one as much or more can be done by extraction as by the long drawn out administration of orthodontic treatment.

# CLASS I MALOCCLUSION*

ASHLEY E. HOWES, D.D.S., NEW ROCHELLE, N. Y.

THIS is a case of Class I malocclusion, probably due to lack of development of the deciduous arch, and complicated by the lower lip getting under the malposed maxillary central incisors. The boy was thirteen and a half years

Fig. 1.

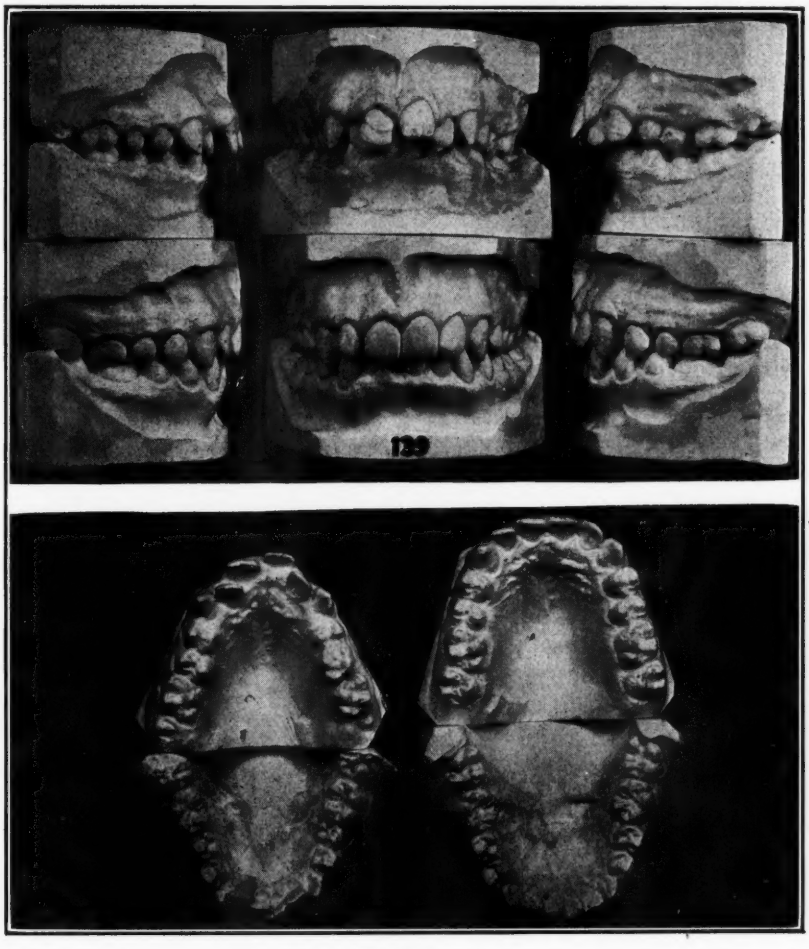


Fig. 2.

Figs. 1 and 2.—Models made March, 1926, and February, 1932.

old, of average development. Radiographs showed that too long retention of the maxillary left second deciduous molar had caused the lingual displacement of the second premolar beneath it, or else the malposed unerupted second pre-

*Presented to the American Board of Orthodontia.

molar did not cause the proper absorption of the roots of the deciduous molar. In any event this deciduous tooth was extracted before appliances were placed.

*Treatment.*—The first appliances used were removable lingual arches with auxiliary springs for the general development of the arches. On the maxillary teeth there was also a buccal arch for the retraction of the maxillary central incisors. This buccal arch was afterward replaced by a high labial arch with 24 gauge J springs going into tubes on bands on the four anterior teeth. These appliances were removed, and Hawley retaining plates were placed. Active appliances were worn from April, 1926, until March, 1930, when the retaining plates were placed. While I am trying to use retaining plates as little as possible, I feel that they have a definite function in this type of case, in which a number of rotations and varied movements have been done. There seems to be a tendency for rotations to reoccur, which cannot be explained by faulty occlusion or abnormal muscular habits, but must be due to some inherent tendency of the tissues immediately surrounding the individual tooth, principally the peridental membrane, to return the tooth toward its original position. The patient has developed physically during the progress of this case until at nineteen he is a big fellow of 185 pounds with powerful muscles of mastication, noticeably standing out during contraction. He has not yet fully discarded the retainers because when they were left off about a year ago the right central incisor began to tip distally. A spring was added to the labial arch of the retainer, and this relapse was corrected somewhat; but as can be seen in the models (Figs. 1 and 2), it was not corrected fully. What the final result will be five years from now can only be seen by waiting.

# Department of Dentistry for Children

## AMERICAN SOCIETY FOR THE PROMOTION OF DENTISTRY FOR CHILDREN*

THE eighth annual meeting of the American Society for the Promotion of Dentistry for Children was held August 6, 1934, in the St. Paul Hotel, St. Paul, Minnesota. Dr. Haidee Weeks, president, called the meeting to order at 9:30 A.M. in the Capitol Room. More than sixty members were present, and many friends of the Society and interested members of both the dental profession and lay public asked permission to attend the sessions. The president-elect, Dr. Charles A. Sweet, and the secretary-treasurer, Dr. Walter T. McFall, were present to assist Dr. Weeks with the meeting.

Greetings were extended the Society by Dr. R. O. Green of St. Paul who was chairman of the Welcoming Committee of the American Dental Association. The minutes of the last meeting were read and approved. The treasurer's report was accepted and filed for auditing by Frank F. Lamons and Claude W. Bierman, the Committee appointed by the president. Dr. Sweet occupied the chair as President Weeks gave her address. Dr. Bierman reported for the Committee on Local Arrangements.

The many splendid reports which had been prepared after a strenuous year of work by the committees were as follows: Diet Committee, C. L. Drain, chairman; Round Table Luncheon Committee, Lon W. Morrey, chairman; Standardized Examination Chart, Lon W. Morrey made this report as he had worked with the late Dr. F. Blaine Rhobotham, chairman, who died in May; Examination of Chart Committee, Alfred Walker, chairman; Bibliography Committee, Joseph H. Kauffmann, chairman; Membership and State Unit Committee, Charles A. Sweet, chairman; Membership Certificate Committee, John E. Gurley, chairman.

Reports from the different sections of the country where work is being done for children were given by Weeks of Louisiana, Beatty of Pennsylvania, Morgan of Wisconsin, Morrey of Illinois, Sweet of Northern California, Wisan of New Jersey, McFall of Georgia, Pettibone of Ohio, and Gardner of Nebraska.

Valuable suggestions were given on the progress and interest of work with children everywhere. Many of these reports told of the progress made toward gathering valuable information and of disseminating this information. Plans, programs, and original ideas were presented for all phases of work with children and in dental health education. The need for more intensive work in certain aspects of our work was discussed, and the opportunity and privilege were presented every one present to ask questions. At noon the meeting was adjourned for the Round Table Discussion luncheon in the Old Colony Room of the St. Paul Hotel.

*Annual Meeting held in St. Paul, Minn., August 6, 1934.

The Round Table Discussion luncheon was arranged to offer the members an opportunity of discussing specifically and generally those problems they wished to have information or help on. Outstanding table leaders had been selected; these men worked up a most interesting series of leading questions for discussion on each of the seven subjects to be discussed.

After a delightful and enjoyable luncheon at which the members came to know each other, to feel perfectly free to ask any questions or to tell their ideas on the topic for discussion, President Weeks introduced the following men who had honored us with their presence and who told us in glowing terms of their admiration and appreciation for the great work the American Society for the Promotion of Dentistry for Children had done and was doing, for the inspiration and help received from their associations with this group, and for the help given the American Dental Association and organized dentistry throughout the length and breadth of our land because of the helpful leadership, fine clinical and professional contribution our members had made. Arthur C. Wherry, president of the American Dental Association, Frank M. Casto, president-elect of the American Dental Association, and one of our own members, C. N. Johnson, that grand old man of dentistry who is editor of the American Dental Association Journal and a strong champion of children's dentistry, F. W. Gethro, Arthur D. Black, and Harvey J. Burkhart.

Table topics and their leaders were:

1. Prophylactic Odontotomy, Dr. T. P. Hyatt.
2. Prosthetic Appliances and Space Maintainers, Dr. Claude W. Bierman.
3. Dental Health Educational Methods, Dr. E. L. Pettibone.
4. Malocclusion, Dr. O. W. Brandhorst.
5. Diet Essentials in the Control of Dental Caries, Dr. C. L. Drain.
6. Root Canal Therapy, Dr. John E. Gurley.
7. May Day and Child Health Day, Dr. Samuel D. Harris.

Each of the table leaders gave a five-minute summary of the results and decisions of his table group on the subject discussed. The information resulted in helping every one present to a better idea of these important phases of work. This discussion luncheon amounted to a small postgraduate course in concentrated form and was both interesting and beneficial.

The afternoon session was devoted to the reports of other groups and committees. A most interesting report was that of the *Review*. The Committee on the Constitution and By-Laws read and discussed the new portion of the proposed constitution. All articles and sections were discussed and passed, and now we have a splendid constitution; one which will better help all. A memorial service was held for the late Dr. F. Blaine Rhobotham. Dr. Lon Morrey read beautiful and fitting resolutions and the members stood in silent memory and love for a friend and comrade who has been called home.

The Committee on the President's Address reported on the many good suggestions of the president. The need for a committee to assist the dentist to obtain a better knowledge of education and health education training and understanding was discussed. A need for a real live visual education committee

was discussed. The desire for affiliation and membership with the American Association of Dental Editors was passed by motion. The Committee on Resolutions brought in many valuable suggestions which were all acted upon. The election of officers and editor and members of the executive council resulted as follows: President, Charles A. Sweet, Oakland, Calif.; President-elect, Frank A. Delabarre, Boston, Mass.; Secretary-Treasurer, Walter T. McFall, Atlanta, Ga.; Editor, Samuel D. Harris, Detroit, Mich. According to the newly adopted Constitution and By-Laws the two immediate past presidents and four additional members from the membership at large were to be elected to serve on the executive council: John E. Gurley of San Francisco and Claude W. Bierman of Minneapolis for two years; H. Shirley Dwyer of Brooklyn and Lon W. Morrey of Chicago for one year.

The following committees were appointed to serve for the new year:

Examination Chart and Procedure Committee, Lon W. Morrey, chairman, Alfred Walker and O. W. Brandhorst.

State Units Committee, Frank A. Delabarre, chairman, to select whom he wishes to assist him.

Membership Committee, Walter T. McFall and secretaries of all State Units.

Editorial Committee, John E. Gurley, chairman, John O. McCall and O. W. Brandhorst.

College Committee, George E. Morgan, chairman, Floyde E. Hogeboom, and Guy S. Millberry.

Bibliography Committee, Joseph H. Kauffmann.

Visual Education Committee, Frank A. Delabarre, chairman, Thomas B. McCrum, and B. Elizabeth Beatty.

Diet Committee, Thomas A. Gardner, chairman, John C. Brauer, and C. L. Drain.

Fellowship Certificate Committee, Haidee Weeks, chairman, three years, Walter T. McFall, two years, and Stella Risser, one year.

Publication Committee, Walter C. McBride, chairman, and Claude W. Bierman.

Constitution and By-Laws Committee, Frank F. Lamons and Konrad Lux.

Several other members reported from their states for work being done, Lamons of Georgia, Lux of Texas, Hyatt of New York, Delabarre of Massachusetts, and Burkart of Michigan. The newly elected officers were inducted into office. Dr. Sweet, the new president, made a few appropriate remarks and pledged his best efforts in our behalf. Dr. John O. McCall told of the splendid program planned and arranged for the Greater New York Better Dentistry Meeting in December and invited all present to attend. The meeting adjourned at 4:45 P.M.

# PRESIDENT'S ADDRESS

AMERICAN SOCIETY FOR THE PROMOTION OF DENTISTRY FOR CHILDREN*

HAIDEE WEEKS, D.D.S., NEW ORLEANS, LA.

IT SEEMS almost needless, perhaps rather presumptuous on my part, to express my appreciation of the honor that you conferred on me two years ago when you made me president-elect of the American Society for the Promotion of Dentistry for Children. One must accept such an honor with humility and with a keen realization of the responsibility it carries. One must realize that one cannot discharge efficiently the duties that one assumes and that one must be called upon frequently to make decisions that will not be approved.

I must take this opportunity heartily to thank my predecessor, Dr. Hyatt, for his preceptorship in acquainting me with his actions and decisions the entire term of his presidency. I knew full well what he had done and, putting his success as president as my goal, I have striven to emulate him.

My best effort has been given to the task at hand, and the duties of this office have been discharged to the best of my ability.

May I say that every member who was asked to serve on a committee accepted, except one. Nine committees have functioned this year.

The greatest sorrow we have experienced in our eight years of organization was our loss of F. Blaine Rhobotham. It will be difficult to carry on without him. We feel his loss keenly. He was ever ready to serve for children's dentistry, which was his life's work, and in that work he achieved great success.

The Constitution and By-Laws Committee has revised our Constitution and By-Laws, making it more in keeping with our growth and the organized State Units.

The Committee on Standardized Charts has been preparing further the work on the chart. In Illinois, the chart has been used with marked success.

The Committee on Procedure for Examination of the Chart has planned a procedure which is of inestimable value in the use of the standardized chart.

The Local Arrangements Committee has provided a place of meeting and the luncheon in the St. Paul Hotel.

The Round Table Luncheon Committee has provided speakers for the luncheon.

The Membership and State Organization Committee has added state groups and new members. The membership has gained the greatest number of members in any year of the Society's existence.

The Bibliography Committee has worked diligently. Dr. Joseph Kauffmann's contributions to the *Review* give evidence of his work.

The Diet Committee has also served well.

*Eighth Annual Meeting, August 6, 1934, St. Paul, Minn.

Letters were sent to every officer and member of the Board of Trustees of the American Dental Association reminding them of an omission of the Executive Secretary to bring before them the motion of our Society recommending the change of name from Mouth Hygiene Section to Children's Dentistry and Oral Hygiene. Dr. Pinney has assured me that he will bring this before the members and that the change of name will be made before the 1934 meeting.

The president of every state dental society was written to and was asked that a topic on children's dentistry be included at the annual meeting and was told that if they could not supply a speaker, the American Society for the Promotion of Dentistry for Children could. The result was that in forty-two states a clinic on children's dentistry was given, and our members gave the majority of the clinics.

The *Review*, of which we are all so proud, was launched following our 1933 meeting. We have had four numbers, and it is a credit to us. Samuel Harris and Walter McBride deserve much credit.

Because of my experience during the past year, I wish to submit to you the following recommendations:

1. That we have four members on our Review Board; two in addition to Samuel Harris and Walter McBride.

2. That the Director of State Organization have a definite program for State Units, and keep in close touch with them. I suggest that the president-elect be given this work, as it will put him in closer touch with the organization over which he will preside the following year.

3. That the Public Relations Work be stressed, and that there be five on the Committee.

4. That for outstanding work in dentistry for children in scientific research in teaching and writing, we make our member a Fellow. The reason for such recommendation is to be made in writing, and sent to the Executive Committee.

5. That the incoming president be supplied with a copy of the minutes of the meeting and the recommendations.

6. That a special committee be appointed to make use of Charles F. Bodecker's excellent chart, "The Classification of Dental Caries," and alter this chart for the understatnding of the laity. A letter to me from Dr. Bodecker says, "I would be delighted to have your organization make use of the tables and would appreciate seeing any changes you wish to make, for I realize that it will be necessary to alter them somewhat for the lay understanding."

7. That our Publications Committee, consisting of five members, have on hand, at all times, articles relating to dentistry for children which can be released at once to any ethical scientific journal.

8. That a Committee be formed for the purpose of standardizing technic in operative procedures in dentistry for children.

In conclusion, may I express my very deep gratitude and sincere appreciation to the officers, committee members, and to each member of the Society.

The American Society for the Promotion of Dentistry for Children owes a debt of gratitude to the Secretary-Treasurer, Walter T. McFall, who finishes his first year of service in that office. Any president who has to carry on without the efficient aid and cooperation of Walter McFall has my most sincere sympathy. A more earnest, more dynamic personality in the world of dentistry for children cannot be found, and I cannot express my personal indebtedness to him.

As the shadows lengthen and I trail down life's slopes, this year will be outstanding; to have known all of you has given me rare pleasure, to have served you has been the rarest of privileges.

1203 Maison Blanche Bldg.

# COMMITTEE REPORTS OF THE AMERICAN SOCIETY FOR THE PROMOTION OF DENTISTRY FOR CHILDREN*

## REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS

This committee recommends that all of the President's recommendations be accepted; however, we would suggest that Recommendation 4 be changed, in that a fellowship committee be appointed. This would enable the committee to study the candidates.

It is suggested that the President appoint three members to serve on the Fellowship Committee and that their terms of office be as follows: one for one year, one for two years, and one for three years, and that hereafter at each annual meeting one member be appointed to serve for three years.

Respectfully submitted,
Thaddeus P. Hyatt,
Frank F. Lamons,
John C. Brauer, Chairman.

## REPORT OF COMMITTEE ON DENTAL NUTRITION

The committee felt that in view of the recent Curriculum Survey Committee Report it would be wise to determine if possible the attitude of the American dental schools regarding the teaching of nutrition to dental students. We, therefore, prepared a questionnaire containing the following questions:

1. Do you have a course in Dental Nutrition?
2. How many hours?
3. Who teaches the course?
4. (a) If answer to Question 1 is "No," do you contemplate the organization of such a course as recommended by the Curriculum Survey Committee?
   (b) How soon will this course be offered?

This questionnaire was sent to 44 schools, all members of the American Association of Dental Schools. Of this number, replies were received from 28, or 64 per cent. Seventeen of those that answered, or 61 per cent, stated that such a course was given. Ten, or 39 per cent, gave negative answers.

The courses already given average about 20 clock hours. Of the ten not offering courses at present, six, or 60 per cent, definitely stated that such a course will be organized as soon as possible. Two have decided against such a course, and three have not had sufficient time to study the situation.

The committee feels from this response that dental schools are giving this important subject more consideration than previously, but that additional stimulation is needed. With this in mind the committee recommends that a similar

*Eighth Annual Meeting held in St. Paul, Minn., August 6, 1934.

committee be appointed further to bring to the attention of dental schools the importance of dental nutrition.

Respectfully submitted,
John C. Brauer,
Thomas A. Gardner,
C. L. Drain, Chairman.

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REPORT OF THE DENTAL EXAMINATION CHART COMMITTEE

Because of the untimely death of Dr. Blaine Rhobotham, Chairman of the Committee on Standardization of Dental Examination Charts, President Weeks has requested that I [L. W. M.] present this Committee's report.

Although the examination chart in its present form has been approved by both the American Society for the Promotion of Dentistry for Children and the Dental Education Committee of the American Dental Association, the Committee felt that it should be subjected to the acid test of use before much effort was made to adopt it as standard. Consequently, Dr. Rhobotham, in the fall of 1933, persuaded the Illinois State Department of Health to have some 6,000 charts printed for the use of their Dental Hygiene Division. Returns from 3,000 of these charts have been received, 2,000 from the state of Illinois and 1,000 from the Health Department of the city of Chicago.

The following suggestions and constructive criticisms have been made by Dr. Floyd Deatherage, Superintendent of Mouth Hygiene, Illinois State Department of Public Health.

1. The size of the chart should be reduced so that it can be filed in the average standard filing system. Possibly a 5 by 8 inch size would be practicable.

2. The total column should include a heading "extractions indicated," "prophylaxis needed," and "first permanent molars extracted."

3. The occlusion heading should include the subheading "lower retrusion."

4. For school examination work, the chart should be so constructed that it could be used over a period of eight to ten years, or the entire life of a child in the elementary school.

Dr. Deatherage has submitted a rough draft of this chart with the headings rearranged so that it embodies all the suggestions just made.

Dr. Hinch of the Dental Division, Chicago Board of Health, suggests that the age at which the child enters school be included on the chart so that the school progress could be more easily determined. He also suggests that a more simple method be devised to indicate in the code that a tooth has been extracted.

The Committee believes that inasmuch as all these suggestions have resulted from several months' actual use of the chart, they should be given serious consideration by this Society.

Respectfully submitted,
George Wandel,
Lon W. Morrey.

REPORT OF COMMITTEE ON EXAMINATION TECHNIC

In presenting our recommendations for an examination technic for children, we recognize that in the end the individual choice will determine the methods, the instruments, and the accessories to be used in any professional procedure, but in the interest of an approach to an acceptable minimum requirement this outline is submitted.

Wherever possible, a thorough prophylaxis should first be provided. If a dental chair is used for the examination, the chair should be elevated to a level that will bring the patient's mouth within the range of the examiner's best vision.

First position: Examination of mandibular teeth. Slight backward tilt to headrest and backrest maintaining the head in prolongation with body without straining the neck. This provides a comfortable position for the child, and when the mouth is opened the plane of the mandible will admit a maximum of light and bring all the teeth into plain view. The child's head should be gently guided into the correct position, so as to avoid the natural inclination to throw the head backward thus shutting out the light and the view of the mandibular teeth.

For the examination of the maxillary teeth, the same position may be maintained and a mouth mirror used for indirect examination.

For direct examination, the headrest is brought to a slightly lowered and receded position, the chair may be given a slight backward tilt, providing for a backward tilt of the head without unduly extending and thus bringing the neck into a strained and uncomfortable position.

When dental chairs are not available, it is desirable that the patient assume a position approximating the above as nearly as possible. Good light is important, and daylight or artificial light should always, if possible, be supplemented with the dental mouth lamp. Some means for magnifying the tooth surfaces should be provided. Having provided a maximum of light, and with the aid of a mouth mirror, all gross abnormalities, such as missing teeth, carious cavities, retained roots, misalignments, inflamed areas, or other evidence of pathologic conditions, are noted.

Next, with a suitable fine-pointed explorer, all exposed and accessible tooth surfaces are carefully examined. The explorer is passed over all accessible surfaces of each tooth separately; beginning with the distal tooth on one side pass the instrument over the lingual, buccal or labial surfaces of each tooth in turn, being particular to examine carefully the buccal grooves on the molars. For approximal caries, explorers should be used from both sides. Examine from the lingual side and also from the buccal side. Often a cavity cannot be detected when the examination is made from the buccal side but can be detected from the lingual side. Pass the instrument between the proximal surfaces, and at the same time note any visual evidence of extensive interproximal caries, such as abnormal shading which would indicate undermined enamel; the occlusal surface should next receive attention. All food and other débris which may have been retained must be removed. This may readily be accomplished by

passing the explorer back and forth in the grooves, alternately syringing with warm water and drying with compressed air; swabbing over with pledgets of cotton carrying alcohol is an additional aid. Conditions in the occlusal grooves will in this way readily be brought to view, and with the aid of explorer and magnification, detection of the abnormalities and determination of their character may be noted.

In conducting these examinations, it is necessary that all food débris be removed from between the teeth as well as on the occlusal surfaces. This may be accomplished by forcing and flushing with streams of warm water and drying with compressed air. It is also important that dryness be maintained by the use of cotton rolls or napkins or other suitable means. Transillumination is a valuable aid.

For pulp testing the electric pulp tester is invaluable. Percussion and other methods are, to be sure, acceptable but cannot always be relied upon to provide definite information as to pulp vitality. Gingival inflammation in any degree should not be judged on the basis of appearance alone. Exploration should be carefully made to determine the presence or absence of deposits or periodontal pockets. Under favorable conditions moderate separation of the teeth may be resorted to for the detection of interproximal caries.

A mouth examination cannot be complete without a full mouth roentgen ray examination. When it is desired to examine for caries only, bite wing film may be used for all proximal surfaces not plainly visible to the eye. Where the second permanent molar has not erupted, one bite wing for either side will usually suffice. Where the second permanent molar has erupted, two bite wings for either side will provide more complete information. The technic of two bite wings for each side is especially helpful in avoiding overlapping of misaligned teeth, which cannot always be avoided in a single film for a side.

Mouth mirrors used in examinations should always be clear and the surfaces free from blemish.

The explorers should have sharp points not coarser than will definitely catch in 36 B & S gauge.

Magnification by Binocular Loupes, dentostomatoscope, etc.

The Committee wishes to make it plain that this report is submitted without thought of being dogmatic.

We recognize that examination technic will vary with the individual. We desire, however, to encourage a more painstaking procedure than is usually followed and to discourage the so-called examination which is nothing more or less than a casual survey. Such a procedure accomplishes little for the benefit of either patient or dentist. Its very lack of thoroughness leaves the patient with a false impression of what a dental examination should be and is in consequence a procedure unworthy of members of the dental profession. Appended to this report is a photograph of a device which will prove helpful in charting mass examinations.

In school or other large group examinations it is necessary to have a recorder assist the examiner; for if alone, the examiner in order to record is obliged to

put down the explorer and in turn pick up the pencil for recording purposes. This alternate putting down and picking up is time consuming, not to say annoying.

Having a recorder in attendance doubles the personnel. It is believed, therefore, that the marking device referred to, and which may be attached to the handle end of the explorer, will prove a welcome aid.

The device is an adaptation of the ordinary metal tubular type of pencil which engages the standard type of graphite point. It is easily slipped on or off, is sterilizable and replaceable.

Mr. Robert Kerr has suggested that a rubber tip be placed on the explorer handle, this tip to be used in conjunction with an inking pad.

We cannot close this report without referring to the great variety of explorers, not alone in their types but also in their dimensional proportions. Greater efficiency would be served if a standard design for explorers and mouth mirrors could be worked out. Such a design to be acceptable should provide for dimensions as well as shape.

This Committee therefore recommends the appointment of a committee which shall report at the next annual meeting with definite recommendations for design and dimensions of explorers and mouth mirrors.

The Committee further desires to call attention to a matter of importance, which might well receive the serious consideration of this body. We refer to the failure to note in dental records the severity of the defect recorded. This omission has been discussed informally many times during the past several years, and has recently been criticized in a report of a survey made in New York City schools by the American Child Health Association.

There will, we think, be little disagreement with the statement that the recording of the severity of the defect is desirable because of its very practical importance. This information may be included on dental charts by the following very simple method of classification:

| | | |
|---|---|---|
| *Caries* | First degree: | Enamel only involved. |
| | Second degree: | Dentin involved. |
| | Third degree: | Pulp involved. |

In recording, the cavity symbol or mark on the chart is accompanied by the numeral 1, 2, or 3 indicating first, second, or third degree caries. This simple procedure provides a rapid and easy means for classifying and recording the severity of caries and meets with the demand for a more informative record.

We recognize that it is not always easy to determine with accuracy when superficial caries involves the enamel only and when it has penetrated to or beyond the dentoenamel junction. Since absolute accuracy is not important, an approximate determination will suffice; and, if there is doubt, the purpose will be served if doubtful cases are classified as second degree.

Similar doubt may arise in attempting to determine whether or not a cavity should be classified second or third degree. Bearing in mind that pulp involvement does not necessarily mean actual pulp exposure, the examiner will usually be able to record with a fair degree of accuracy when a cavity falls into the

second or third degree class. If in doubt, the third degree classification will usually provide the more accurate information.

Another situation that has given us much concern for some years, especially in school work, has been the failure on the part of parents to have corrective work done after examinations are made and the parents have been informed of the dental defects.

There are several factors responsible for this; among others, lack of interest in and failure to be impressed with the importance of having dental defects corrected on the part of teachers, nurses, and others charged with follow-up. Dentists should be encouraged to realize more fully the significance of enamel defects. Education in this direction might well start with the student. Unfortunately many teachers in colleges do not place sufficient emphasis on the importance of early detection and prevention.

Also some parents do not understand the importance of early and prompt care of dental defects, and occasionally there is a failure to employ a definite and acceptable program by all the personnel engaged in the follow-up.

An additional item is failure on the part of the dentist to adopt a plan of procedure that will insure a maximum of preventive service. Consideration of the factors enumerated discloses a series of omitted acts rather than errors of commission and further that the problem is largely one of education.

A first remedial step should be an attempt to make a more serious impression upon the parent. The present chart and parent notification are entirely too casual. We assume that all parents understand and appreciate the importance of correction of dental defects, while this is not true.

It is suggested that the chart as well as the accompanying notification form carry a more impressive message—one that will make the parent understand the real seriousness of the condition. The parents must be made to see that the teeth bear a definite relationship to the health of the child; that if they are not taken care of at once, toothache, abscesses, and other complications may follow; and that if continued neglect persists, the cost will increase, teeth may be lost, and injuries may result that can never be corrected.

In addition to the chart or form colored stickers could be used. A chart showing teeth with second degree caries might have a *blue* sticker attached bearing a warning to this effect:

> Your { son's / daughter's } teeth have 7 cavities, all of which should be filled at once. Three of these cavities are already quite deep and may cause toothache at any time. These cavities may be filled now at small expense, but if neglected longer the teeth may be lost.

A chart showing third degree caries might have a *red* sticker attached which would carry information to this effect:

> Your { son's / daughter's } teeth have 12 cavities, all of which should be attended to at once. Two of these cavities are very deep and { may lead to / have caused } abscesses. As a result { his / her } health is endangered, and in addition severe pain may occur at any time, perhaps in the middle of the night. Will you not give this matter your immediate attention and see that your child visits the dentist without further delay?

If this plan is followed, we feel that it will go a long way toward influencing parent apathy and lack of interest, and will tend to minimize procrastination.

Many children do get to the dentist but fail to return after the first visit. Quite frequently, the economic factor is the deterrent to further visits, but often the dentist is at fault. Sometimes it is lack of interest on his part, and at other times his method of procedure is to blame.

It is a mistake to resort to tooth extraction at the first visit when there is other work to be done. While it is true the extraction may be painless and uneventful, the contrary frequently is the case. Even though the removal of the tooth may not be attended by unpleasantness, there is always the possibility of postoperative complications. In any case, the removal of a tooth, especially a permanent tooth, is a dreaded and oftentimes a most disagreeable experience for a child. With these facts in mind, the sensible and more practical procedure should be prophylaxis first, first degree caries next, and the more involved operation to follow, with extraction last, assuming, of course, that possible complications and long drawn out treatments do not interfere with this plan. The advantages are obvious, and we commend these recommendations for your serious consideration.

No attempt has been made in this report to describe in detail each procedure. If it is deemed advisable to elaborate on this report in order to provide details in the various steps, such information could be provided in a supplemental study to be undertaken during the coming year.

Respectfully submitted,
T. P. Hyatt,
Frank Delabarre,
Alfred Walker, Chairman.

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REPORT OF THE COMMITTEE ON MEMBERSHIP CERTIFICATE

This question of certification of memberships is one that has been before us as a profession for many years; and, save perhaps in a few instances here and there, such plan has never been put into action; the reason being that it is so easily abused and so difficult to carry out in proper form. Therefore, we do not feel that we can recommend it to our Society. In addition to this, of course, there is the expense involved, which we feel that we are not able to assume, but this latter is the lesser of the two reasons.

There is one thing that we can do—grant a membership certificate on payment of a $50 life membership fee.

Respectfully submitted,
Charles A. Sweet,
John E. Gurley, Chairman.

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PUBLICATION COMMITTEE REPORT

In a report read before this organization at its Chicago meeting in September, 1933, the establishment of a society publication was strongly recommended. It seemed that $370 would amply cover the cost of 1,800 periodicals,

the number suggested, but $500 was requested, as a margin of safety seemed desirable. For this amount the committee felt that it could send each member of the Society 96 pages of printed material, or six sixteen-page issues in the course of the ensuing year.

After some discussion at the meeting, the matter was placed at the disposal of the executive council. The executive council voted $100 for one test issue to be submitted to the members for their approval, and if a majority of those who voted approved, then up to $400 more was to be allotted to the publication committee for the remaining issues.

Approximately 50 per cent of those listed as active members, some sixty-five, chose to mail in a vote, and with only one exception their vote was entirely favorable. Subsequently, seventy others, not members of the organization at that time, kindly mailed their appreciation of the periodical to the publication office.

Based on this vote of confidence the council, which had all the time been in favor of supporting the publication, acted unanimously in instructing the publication committee that up to $400 was now available for the remaining five issues, or 80 pages of material, promised, and that these be printed and mailed to each member in the interim preceding the St. Paul meeting.

Accordingly, these have been printed and mailed.

However, since that time, our membership jumped rapidly from 132 to 240 members, these extra one-hundred-odd members have also been supplied with each issue.

In addition, approximately 600 extra copies of the initial or November issue, 300 of the January and March issues, and 100 each of the May and July issues have been sent to others, nonmembers, at the request of the secretary or at the request of other members of the Society or at the discretion of the publication committee. In this process, 2,800, instead of the 1,800 copies originally agreed to by the Publication Committee, have been printed.

Further, enclosures and stamped envelopes costing a total of $47 have been used to assist the secretary, to help build the membership, or to increase the circulation of the publication.

Despite these extra expenditures, the total cost of the publication to our organization has been $339—or actually $171 less than the conservative estimate of $500 given by the 1933 committee.

Financially then, publication of the *Review* has been a somewhat pleasant surprise to this committee. In other regards it can be modestly said that the reaction of our members and of the profession in general has been very favorable. If time permitted incorporation into this report of a few of the opinions received from dentists in this country and from Canada and Europe, it should please our members greatly.

It is pleasant for the Publication Committee to make these favorable observations since the *Review* has only been on test this year and the Society must decide whether it shall continue.

Assuming that the Society may be favorably inclined to making the *Review* a permanent part of the organization, the Publication Committee desires to recommend that an editor be appointed, that the publication be issued quarterly to contain a minimum of 96 pages for the year, and that the editor be allowed at least $350 for its publication this next year. This is a most conservative figure in view of the fact that the printer has already cautioned us that his charges for next year will be increased 15 per cent.

For $350, we believe that the periodical may be printed and mailed to each of our 240 members and to as many as 300 members, if in the course of our Society's growth this number should be reached in the coming year.

Should more than 300 copies of each issue be required or should the members decide at this time that 100 extra copies of each issue should be printed to supply libraries and colleges which request these and for exchange with other dental publications, then $50 more will amply cover these extra costs.

The Publication Committee thus recommends that the *Review* be made a permanent part of the Society; that four issues be printed providing a total of 96 pages for each member in the course of the next year, and that $350 for 300 copies or $400 for 400 copies of each issue, as the Society may elect, be allotted to the editor for the coming year's expenses.

With this report and these suggestions the Publication Committee fulfills its obligations and terminates its existence. We thank the secretary, the many contributors, the printers, and the members of this Society in general for their invaluable assistance throughout the year.

Respectfully submitted,
W. C. McBride,
Samuel D. Harris, Chairman.

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REPORT ON STATE UNITS

In endeavoring to carry on the fine work of Dr. Harris during 1933, an organizer for each state unit was selected and was sent the 1933 report and the procedure for organizing permanently. Michigan, New York, California, Georgia, Louisiana, and Massachusetts were ready to proceed, as they already had a working unit. Pennsylvania, Texas, and Nebraska came into the fold and have done exceptionally well under the guidance of Drs. Casto, Stella Risser, and Brauer, respectively. Maryland, under the sponsorship of Dr. Leonard, and Wisconsin, under Dr. Morgan, have signified their intention of organizing.

It is recommended that the constitution of the state unit resemble the parent Constitution as closely as possible. It should be customary to insert a notice in the state bulletin two to three months preceding the annual state meeting, inviting every one interested in dentistry for children to affiliate himself with the state unit.

It is also recommended that only one or two good meetings be held annually and that some definite subject pertaining to children's dentistry be assigned as a group study, each member bringing out the most important points to him, thereby insuring universal interest.

I extend our sincere appreciation of the efforts put forth by the officers of the state units already organized and the organizers of the new groups who have made progress possible.

Respectfully submitted,
Charles A. Sweet.

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REPORT OF THE COMMITTEE ON BIBLIOGRAPHY

Thanks to the management of Dr. Samuel Harris of the *Review of Dentistry for Children,* the support of our esteemed President, Dr. Haidee Weeks, and the active cooperation of Dr. McFall, whose literary reviews are an added attraction to the publication, the work of this Committee may be considered, we hope at least, as modestly enhancing the good cause of our activities. This report may be considered to consist largely of all the previously published contributions under the column "Pedodontia in the Periodicals." We are happy if these pages have pleased our readers, and we shall, if elected to do so, willingly continue in their future preparation, endeavoring also to improve upon their usefulness by giving, at the suggestion of Dr. Harris, brief résumés of the contents of each article mentioned.

We respectfully recommend for consideration of all the members: first, that the Committee on Bibliography be made a standing committee in the proposed revision of the Constitution and By-Laws of the Society; second, that all members of the Society cooperate with this Committee in forwarding to them all useful suggestions, items, and reprints of interest to the organization.

Respectfully submitted,
Walter T. McFall,
Joseph H. Kauffmann, Chairman.

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COMMITTEE ON RESOLUTIONS AND RECOMMENDATIONS

*Publication Committee—Harris*

1. An editor be appointed for a term of three years.
2. An advisory committee of three members be appointed for a three-year term, one to be replaced each year.
3. The editor to be responsible for all matters pertaining to the bulletin or *Review,* e.g., the number of issues, time of issue, contents, and cost of publication.

*Committee on Dental Nutrition—Drain*

Recommended that a committee be appointed to continue study of this very important subject.

*State Units—Sweet*

Recommended that state constitutions be patterned after the constitution of American Society for the Promotion of Dentistry for Children and that each state group have at least one general meeting a year; more meetings, however, should be held in the larger cities where greater numbers are available—four meetings a year, three plus the annual state meeting being recommended.

*Committee on Bibliography—Kauffmann*

Recommended that this committee be subject to the Review Advisory Committee and not be included in the Constitution and By-Laws.

*Committee on Membership Certificate—Gurley*

Life membership certificate to those who desire it upon payment of $50. Otherwise a card issued yearly stipulating payment of dues and member in good standing for fiscal year.

Respectfully submitted,
T. O. Gardner,
Konrad Lux,
Walter C. McBride,
Jack M. Wisan, Chairman.

# A RARE CASE OF OSTEOMALACIA WITH SEVERE CARIES OF THE MAXILLARY CANINE TEETH IN A CAPTIVE BABOON*

M. F. Ashley-Montagu, Ph.D., New York, N. Y.

THE skull described in this paper presents a number of dystrophic anomalies which, so far as I am aware, have never before been described in any other primate, not excepting man. Sir Frank Colyer[1] in his recent interesting book, *Abnormal Conditions of the Teeth of Animals in Their Relationship to Similar Conditions in Man,* describes many related conditions in various animals, but he apparently never encountered a single case displaying so remarkable a group of anomalies as those which characterize the skull described in this paper.

Apart from the fact that the anomalies exhibited by this skull are of such extraordinary interest that they deserve to be described for their own sake, the chief purpose of the present paper is to illustrate by means of these anomalies certain principles of growth and development, which in the present instance are delineated, as it were, in high relief.

## HISTORY

The skull is that of a male baboon, *Papio hamadryas,* from the Primate Collection of the American Museum of Natural History, New York (Accession No. 100331), where it was received on May 14, 1933, from the New York Zoo. I wish to thank Dr. Robert T. Hatt, assistant-curator in the Department of Mammalogy, for the loan of the skull for description.

The animal, as will appear from the following description, was fully adult at death, though not senile. How long it had been in captivity is not known, nor is the cause of its death known.

## DESCRIPTION

The measurements of the skull are as follows:

| | |
|---|---|
| Cranial length (Inion-Glabella) | 123 mm. |
| Cranial breadth | 81 mm. |
| Nasion-prosthion length | 112 mm. |
| Nasion-rhinion length | 58 mm. |
| Pyriform aperture height | 36 mm. |
| Pyriform aperture breadth | 28 mm. |
| Subnasal alveolar height | 18 mm. |

With the exception of the gross appearance of the bone and of the anomalies in the alveolar region, shortly to be described, the skull is of normal form and appearance.

*From the College of Dentistry, New York University, Department of Anatomy.

All the sutures of the cranial vault are obliterated, as are the circummeatal sutures. The basilar suture, as would be expected, is also obliterated. The basilar portion of the sphenotemporal suture is open on both sides of the skull. Within the orbits only the zygofrontal suture is patent; all sutures on the medial wall are obliterated. Upon the facial aspect, the nasofrontal suture is obliterated, the zygomaxillary sutures are completely patent, the left nasomaxillary suture is completely patent; on the right side, however, the inferior half of the corresponding suture is obliterated. On the right side the so-called premaxillary nasal suture is obliterated, and the premaxillary-maxillary suture is entirely obliterated with the exception of a superior portion of some 13 mm. commencing about 8 mm. below the superior lateral angle of the pyriform aperture. It is of extreme interest to note here that terminating in a free suture at a point immediately *medial* to the medial border of the pyriform aperture, and articulating with another portion of the premaxilla in a suture some 4 mm. in length, immediately lateral to this suture the premaxillary-maxillary suture is visibly patent for some 7 mm. The short 4 mm. suture actually represents the persistence of a suture which normally becomes obliterated shortly after birth, by this means obscuring the fact that what is usually taken to be the ascending process of the premaxilla in the Old World Monkeys is actually made up of two distinct elements, a superior nasomaxillary element which apparently arises from a separate center of ossification, and an inferior ascending process of the premaxilla. I have already described these conditions for certain other Old World Monkeys and also for Man.[2] The present example is, I believe, the first case in which the suture has been described in the baboon. The site of this suture in normal skulls of adolescent status is occupied by a depression, which doubtless represents the situation of the earlier suture between the nasomaxillary element and the ascending process of the premaxilla. Owing to the great rarity of very young baboon crania it is not possible to say upon purely a priori grounds that this element and this suture are normal features of the early postnatal baboon skull, but certainly all the indications would suggest that they are so.

On the left side all these sutures are patent, with the exception of the division between the upper and lower portions of the premaxilla which have on the right side been described as separated; only a small portion of the suture is obliterated anterior to the root of the canine tooth; the interincisive suture (intermaxillary suture) is obliterated. The zygotemporal suture on the zygomatic arch is patent, the greater part of the left zygomatic arch has been lost since death, but there can be little doubt that the zygotemporal suture was patent upon this side too. The zygomaxillary sutures and the maxillopterygoid sutures are patent on the lateral walls of the skull.

The two temporal ridges extend from points 15 mm. posterior to the supraorbital notches, between which a table of bone is formed at an elevation of 4 mm. above the frontal bones immediately laterad; the ridges gradually converge until at some 35 mm. distance from their points of origin they rise into a single strongly developed crest which at the lambdoid junction rises

to a height of 16 mm. The lambdoid crests are also well developed, projecting to a distance of 7 mm. at right angles to the surface of the skull. The cerebral portion of the skull is sharply delimited from the orbital portion by a constriction or stenocrotaphy in the pteric regions, the bipteric breadth being 50 mm., a somewhat low diameter for an adult skull of this species, and suggesting an early obliteration of the sutures in this region. The lambdoid crests continue laterally and forward into the attenuated zygomatic arches.

Fig. 1.

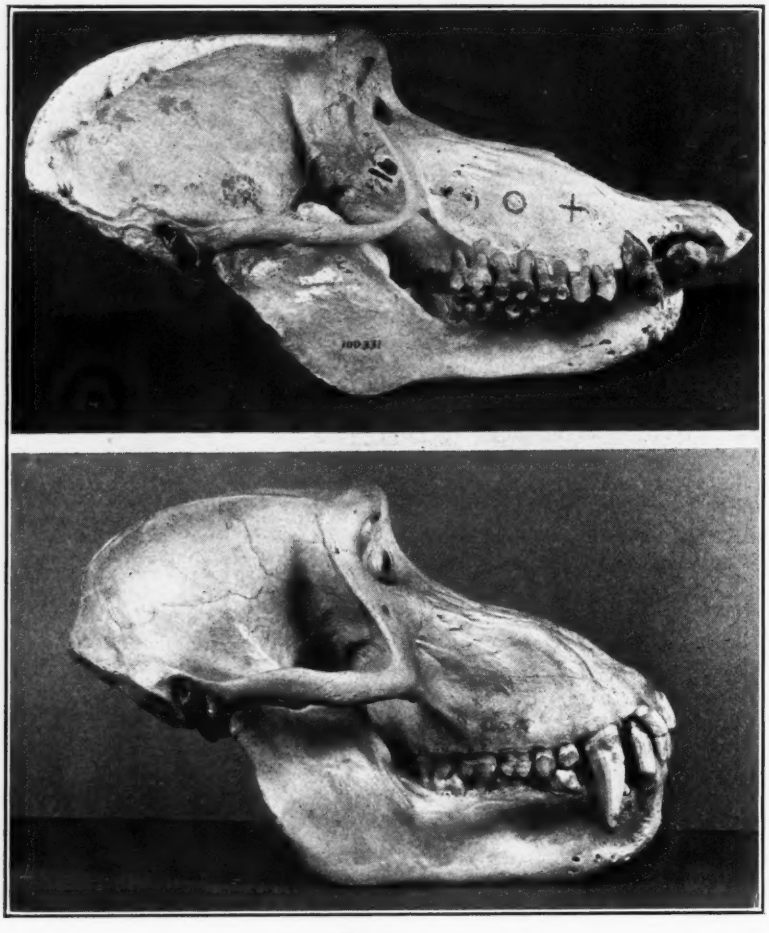

Fig. 2.

Fig. 1.—Right lateral view. The sign + marks the position of the detached apex of the canine root. The sign o marks the position of an isolated dental element which may be clearly seen within the sign o.

Fig. 2.—Right lateral view of normal skull.

These arches are normally particularly robust in the baboon, having an average thickness of some 8 mm., whereas in this specimen the thickness of bone is only 3 mm. This reduction of the amount of bone in the zygomatic arches reflects a condition which has affected the whole skull, the structure of which has been so altered as to present the appearance in many places of being no thicker than paper and a good deal less dense.

The calcium poor appearance, taken together with the rarefaction of the bone, suggests a condition of osteomalacia. That the disease appeared fairly late in the life of the animal is evident from the excellent formation of the crowns of the teeth and the good relative proportions of the skull as a whole.

Fig. 3.

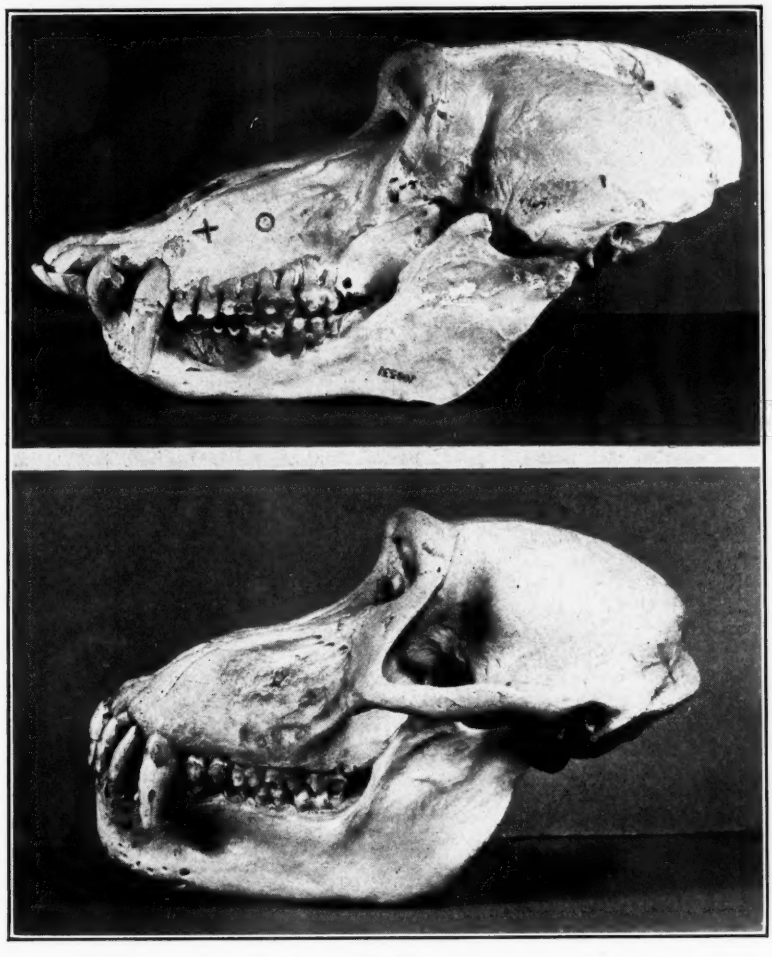

Fig. 4.

Fig. 3.—Left lateral view. The sign + marks the position of the apex of the root of the canine. The sign o marks the position of an isolated dental element similar to that on the opposite side.

Fig. 4.—Left lateral view of normal skull.

## THE ANOMALIES

The immediately striking thing about this skull, including the mandible, is the extraordinary eversion of the anterior teeth including the canines. The long axes of the anterior teeth of both jaws, instead of being perpendicular to one another in an edge-to-edge bite, are almost perfectly horizontal so that their lingual surfaces face and lie in apposition to one another! The oral alveolar portions of the jaws bearing these teeth are actually oriented quite horizontally. Upon the facial aspect of the skull the incisor portion of the premaxilla is almost as horizontally oriented as its oral part; in the mandible

the mental and incisor portions of the jaw are relatively unchanged. As a result of the flattening of the premaxilla upon the oral aspect the diastema between the lateral incisor and the canine in the upper jaw has been greatly increased.

The occlusal surfaces of the maxillary incisor teeth, instead of being at more or less right angles to the axes of the roots, approximate rather to the plane of the roots. The mandibular incisors show occlusal surfaces which lie in the same plane as the roots; the lingual surfaces of these teeth show that the dentin of the roots at the junction with the enamel has become part of the occlusal surface of the teeth. From the erstwhile cutting edge of the incisors to the roots at the alveoli the teeth present a single plane surface.

The apices of the roots of all the teeth exhibit a remarkable malformation in the form of a cauliflower-like concretion of very hard whitish material, of

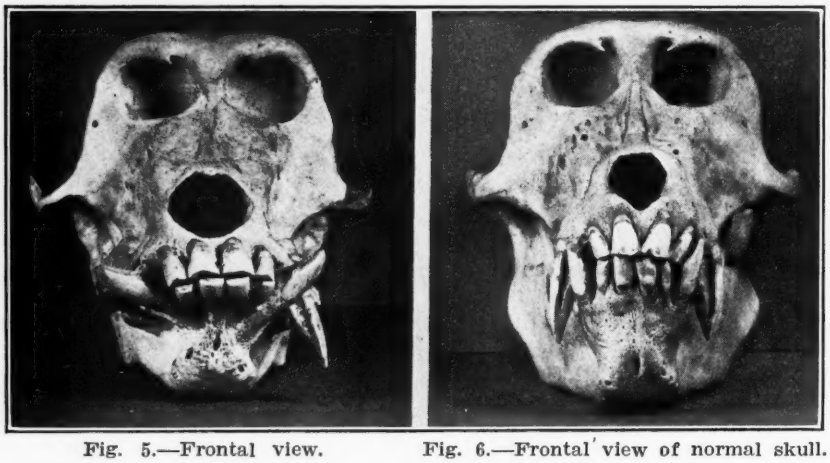

Fig. 5.—Frontal view. Fig. 6.—Frontal view of normal skull.

indubitably broken-down dentin. An example of this concretionary mass is shown in Fig. 11 as seen in the maxillary right central incisor.

The maxillary right canine has been considerably destroyed by caries, and the apex of its root (at the place marked by +) has become detached from the body of the tooth; this detached portion of the tooth presents a healthy appearance, whereas the portion immediately below it presents an almost gangrenous appearance. The maxillary left canine has been less seriously affected by caries, the interior of the tooth having alone been excavated by caries; an opening of this cavity is present on the lingual surface of the tooth near its tip; the enamel has completely disappeared from the mesial and lingual surfaces, but the cutting edge of the tooth at its distal extremity has been maintained. The situation of the apex of the root of this tooth on the left side is marked by +.

With the exception of the premolars of both jaws, and the first molars, excluding the left mandibular, the teeth are in good condition. The mandibular left first molar shows carious defects at the roots; the remaining molars show slight carious cavities.

The molar series of both jaws are considerably everted, the eversion being greater on the right than on the left side. In each case the tooth is everted as a whole in the same plane with its roots. In the maxilla the eversion of the teeth is much less than in the mandible, the degree of total lateral eversion from the perpendicular in the maxilla being about 40°, and in the mandible about 90° in the anterior molars series and about 50° in the posterior molars. The lateral roots of the maxillary molars are all bent medially inward at their apices, but this is a normal feature of the baboon skull. The eversion of the teeth of the maxilla is associated with an extreme reduction of the alveolar processes, which are almost in the same plane with the palatine processes. The highest point of the palate lies opposite the contact points of the second premolar and the first molar, and does not exceed 7 mm.

All the sutures upon the palate are patent, as is the perpendicular portion of the pterygopalatine suture. The measurements of the palate including the alveolar processes (external diameters) and excluding the alveolar processes (internal diameters) are given in Table I.

TABLE I

| EXTERNAL DIAMETERS | | INTERNAL DIAMETER | |
|---|---|---|---|
| Length (prosthion to postnasale) | 108 mm. | | |
| Length (prosthion to alveolon) | 90 mm. | | |
| Breadth | 62 mm. | 36 mm. | |
| Palatal index | 69.9 | 37 mm. | |
| Bi-incisor breadth | 36 mm. | 43 mm. | |
| Bi-canine breadth | 54 mm. | 41 mm. | |
| Bi-Pm 1 breadth | 57 mm. | 43 mm. | |
| Bi-M 1 breadth | 60 mm. | 40 mm. | |
| Bi-M 2 breadth | 62 mm. | | |
| Bi-M 3 breadth | 56 mm. | | |
| Length of palate from M 3 to pyramidal process, left side | 28 mm. | | |
| right side | 31 mm. | | |
| Palatal height | 7 mm. | | |
| Length of premaxilla | 32 mm. | | |
| Breadth of premaxilla | 46 mm. | | |

In the mandible, the lingual surfaces of the crowns of the teeth of all the premolar-molar series, with the exception of the third molars, are actually situated below the level of the lingual surfaces of the superior borders of the body of the mandible; in other words, below the level normally occupied by the alveolar processes. This extraordinary situation is due to the fact that the alveolar body of the mandible has been unable to resist the stresses put upon it by the maxilla, and has simply given way and bent outward in the direction of the thrusts which have been transmitted to it through the teeth. This has proceeded so far that it has resulted in the elevation of an otherwise inferior alveolar lingual position of the mandible to a height above that of the position of the teeth, which normally tower above it, and in the eversion of the perpendicular axis of the teeth in all but the last molars to a horizontal position, so that the crowns of the teeth now face laterally with their occlusal

surfaces projecting beyond the lateral surface of the body of the mandible for an average distance of 11 mm.

When the two jaws are in relation to one another, the occlusal surfaces of the maxillary and mandibular premolar-molar series are at right angles to one another.

Rarefaction of the bone of the ramus of the mandible has proceeded most in the portion anterior to the neck, where it is as thin as India paper. The condyles have undergone such changes that they give the appearance of having "melted." The remainder of the mandible exhibits the effects of rarefaction, but to a lesser degree than in the anterosuperior portion of the ramus.

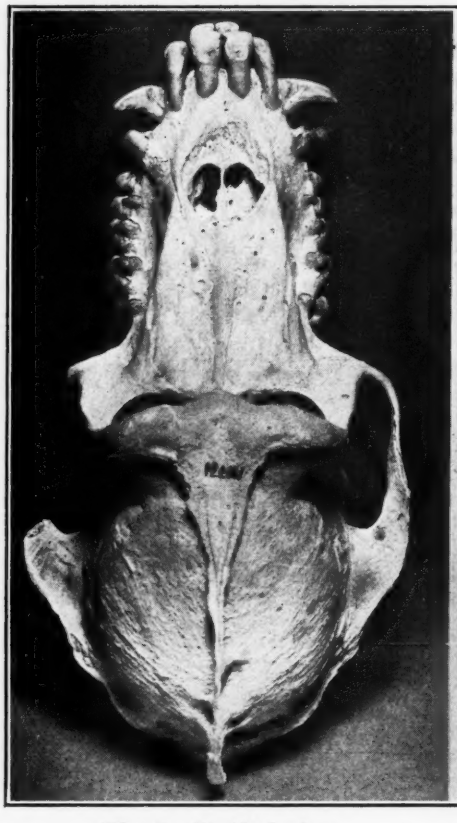

Fig. 7.—Vertical view.

Fig. 8.—Vertical view of normal skull.

This latter portion of the ramus exhibits the most striking change only because it is normally the thinnest part of the mandible, and not because it has been the specially selected site of the halisteritic process of osteomalacia.

## DISCUSSION

The anomalies exhibited by the skull described above are all unquestionably due to an affection which was produced quite late in the life of the animal, by a deficient diet and probably an inadequate amount of sunlight. Had the disorder been initiated during the infancy of the animal, the subsequent changes would have been of a very different nature, though produced by essentially the same factors as those which have operated in the present case.

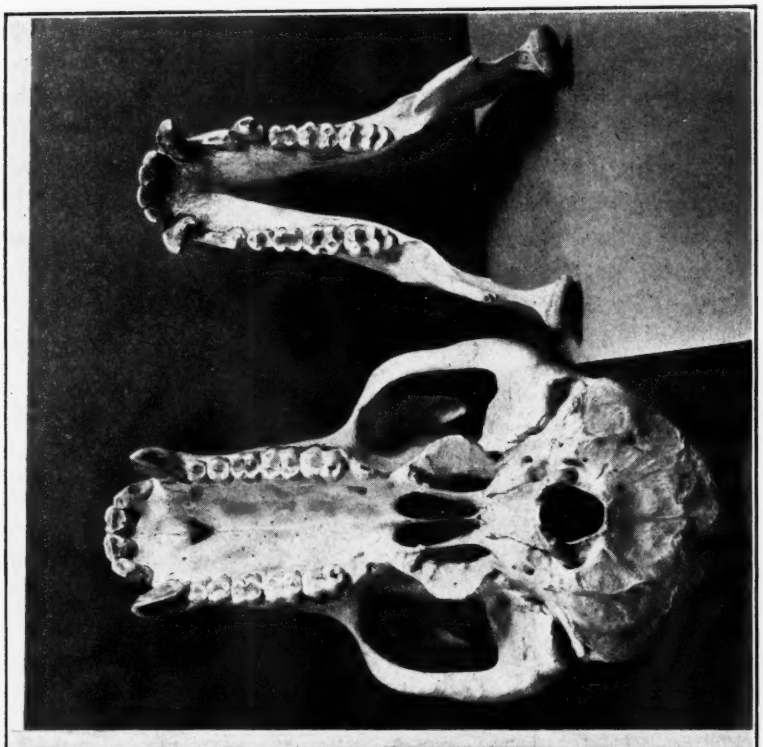

Fig. 10.—Occlusal view of normal skull and mandible.

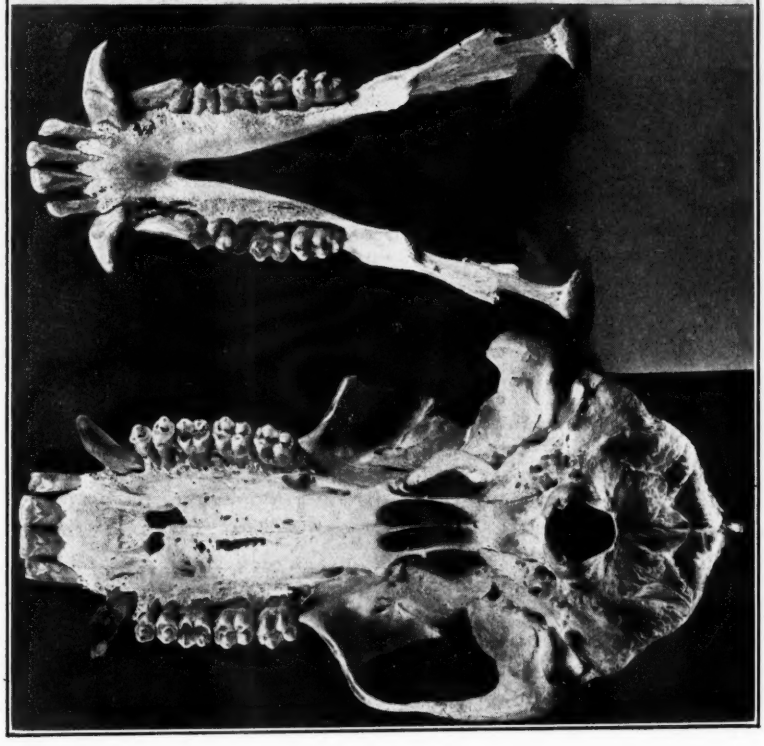

Fig. 9.—Occlusal view of skull and mandible.

In the younger individual we should have called the disease *rachitis;* in the older individual, as in the present case, we call the disease *osteomalacia.* In the younger individual the form in which the disorder would have resulted would have been influenced to the greatest degree by the developmental status of the animal, the deformities being much more various and serious at the differentiating or developing stage of life than at the merely maturative growth stage of increase in size. Thus, in the young individual there would have been considerable changes in the relative form of the skull and the rest of the skeleton (the rest of the skeleton is not available in the present instance); in the older individual the skull has been completely uninfluenced so far as its relative form is concerned, the changes produced being strictly limited to the structure of the bones.

In the present case the structure of the bones of the skull has undergone considerable alteration. There has been a chronic process of halisteresis, or absorption of salts, resulting in a great rarefaction of the substance of the

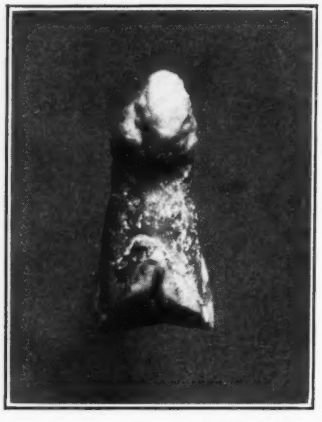

Fig. 11.—Lingual view of right maxillary central incisor showing the peridental mass at the apex.

bone, and it is quite evident that the haversian systems and their associated para cellular matrices have completely broken down. These conditions are strikingly reflected in the alveolar regions of both jaws, which, structurally being no longer able to resist the stresses transmitted to them through the teeth, have given way together with the teeth borne by them to the limits of the forces operating upon them. In other words, the eversion of the teeth and of the alveolar processes described above has proceeded to a stage beyond which it would, in this particular skull, be physically impossible to go.

The changes in the relations of the teeth have, of course, followed upon the changes in the structure of the bone supporting them, and not upon any changes in the teeth themselves. Once more the intimate dependence of the teeth upon their bony supporting structures is here illustrated. The unique malocclusion exhibited by this skull is entirely due to the original nutritional disturbance which initiated the disease, and the condition we see here in such exaggerated high relief suggests that in less striking instances nutritional disturbances locally affecting the skull may be responsible for conditions of malocclusion which under other circumstances would not have occurred. One

may well wonder whether conditions like rachitis have been sufficiently taken into consideration in the study of adult malocclusion. Defects early produced in the jaws and not grossly recognizable in the adult may well be the source of some, at least, of the disorders of occlusion which adults present. As may be judged from the present case, a disease like osteomalacia in the adolescent or adult may have an enormous effect upon the dentition. The osteomalacia of pregnancy and parturition with the associated loss of one or more teeth has long been known to the clinician, but I do not recall having seen the disease referred to as a possible factor in the production of malocclusion. That osteomalacia can be the dominant factor in the production of malocclusion is very evident from the disorders which have been described in the captive baboon which has been the subject of this communication. It is here suggested that a transitory condition of osteomalacia may sufficiently disrupt the integrity of the structure of the bony support of the teeth so as to produce a disordered relationship among some or all of them.

REFERENCES

1. Colyer, F.: Abnormal Conditions of the Teeth of Animals in Their Relationship to Similar Conditions in Man, London, 1933.
2. Ashley-Montagu, M. F.: The Premaxilla in the Primates, Quart. Rev. Biol., May and June, 1935.

# THE ATTAINMENT OF HEALTH THROUGH DENTAL HYGIENE

HUGH D. WILSON, D.D.S., TOPEKA, KAN.

AS A result of the cooperation of all divisions of the healing art, dentistry has advanced until today the thoughts of health and the dental apparatus are synonymous. Dentistry has become a scientific department in the healing art since the beginning of the twentieth century and has steadily progressed until today, through increased knowledge of dental surgeons, many thousands of health impairments are being corrected or at least considerably improved by its modern practice.

One phase of life in which the dentist is more seriously concerning himself is that of the prenatal child. The deciduous, or baby teeth as they are more commonly known, begin their formation in early fetal life and must have an adequate supply of minerals and vitamins to prepare them for proper protection from caries during their five to ten years of service. Often the mother is not fortified with the additional amount of calcium, phosphorus, and vitamins necessary to supply her child. This deficiency may cause decalcification of her teeth, and in some instances the mother's teeth may be lost. Seemingly few who should concern themselves stress the importance of a dietary adjunct for the expectant mother.

Deciduous teeth and permanent teeth should receive the same careful attention. Deciduous teeth are often considered as being temporary and are frightfully neglected. If adequate dental attention (prophylaxis and filling) is given the deciduous dentition, material difference is noted in the health and alignment of the permanent teeth. Deciduous teeth should be removed at a certain period of the child's life in order to assure proper spacing for the eruption of the permanent teeth. Irregularity of the permanent teeth is often the resultant of premature loss of the deciduous teeth, and retaining them too long will produce a like condition. Teeth and jaws which are malformed build a mental hazard and promote early disease of the teeth and tissues; however, this can be corrected by an orthodontist.

Diseases attributed to foci of infection are many times due to abscessed teeth. The abscessed teeth may be of either the deciduous or the permanent dentition. It is well known that arthritis, neuritis, stomach and duodenal ulcers, heart lesions, infections of the eye, ear, sinuses, throat, and many other similar conditions are due to focal infections which in many instances are of dental origin. There are two types of dental abscesses—the apical and the parietal. The apical abscess is on the root end and is due to devitalization of the pulp or the invasion of caries into that member. The parietal abscess is on the side of the tooth and is commonly called pyorrhea.

Read at the Annual Health Officers School, Topeka, May 6, 1935.

An outstanding example of the dental apparatus acting as a focus of infection is the case of a young woman, twenty-five years old, presenting an unclean, dull, and worn general appearance of her whole person. Her physician had insisted that attention be given the maxillary right lateral incisor region in which the tooth had been removed about two years previously. Suppuration had started immediately after the removal of the member and was still continuing. X-ray examination revealed the necessity of removal of the maxillary right central incisor and curettage of the abscessed area. This tooth was extracted Dec. 20, 1931. Previous to visiting the dentist the patient had suffered from appendicitis, and arrangements had been made to remove the appendix on Dec. 23, 1931. The removal of the abscessed condition so completely relieved her physical condition that the physician thought it wise to postpone the appendectomy. To date the operation for the appendix has not been performed, and when seen May 6, 1935, she was having no trouble of that nature.

The foregoing case gave briefly the results of an apical infection of a tooth. In this case periodontoclasia, more commonly pyorrhea, played the rôle of the focus of infection. Few physicians and dentists place sufficient importance on the dangers of periodontoclasia as a focus of infection. They are considerably concerned when a large abscess stares them in the face. The following is an example of periodontoclasia as a focal site: a man, thirty-three years of age, was examined by his physician and was found to have hematuria. He was advised to consult his dentist. After extraction of all the teeth the condition was completely relieved. All the teeth were loose, and the tissues had receded until from one-third to two-thirds of the root surfaces were exposed. There was suppuration around all teeth.

Vincent's infection, more commonly known as trench mouth, must receive more attention. Some states require that reports of such cases be sent to the board of health. Some cases have been so severe as to cause death. Whenever the disease is treated, the patient should receive complete prophylaxis after the bacterial examination is negative. Probably a great percentage of periodontoclasia cases are the resultant of Vincent's infection. The prophylaxis following medicinal treatment should not be a slipshod proposition of ten or fifteen minutes' duration. The scaling, curettage, flossing and polishing of the five surfaces of each tooth should be most complete to prevent chances of future infection and bacterial invasion.

Impactions, or teeth which have not erupted and are buried in the tissues and bone, present various problems. The nervous system often suffers as a result of these malpositions. A young woman, twenty-two years old, had suffered from a shaking of her whole body since she was about fourteen years old. She could not hold a cup of coffee in one hand after four hours of stenographic work. It was impossible for her to read a book for more than a half hour because the shaking made the print blur. For several years she had consulted physicians, but no one found a clew. Pain developed in the mandibular left third molar area. Clinical examination showed nothing. X-ray pictures were taken, and an impaction of the mandibular left third molar with a forty-five degree coronal portion anteriorly was found. Re-

moval of this tooth caused a cessation of the shaking condition. The right mandibular third molar was found in similar position and was removed. Following these two operations the patient reported that no nervousness remained.

What the future holds for dentistry is a great mystery; however, in one dental clinic, work is being done whereby irregular teeth are straightened by endocrine therapy. Is diet the only factor in dental caries? When a cavity appears on a certain tooth and upon inspection of the corresponding tooth on the opposite side of the jaw a cavity is found in the same position, is that caused by diet? When this is true, in nearly all cases, could diet be considered the most important treatment? Possibly in the not far distant future the physician and the dentist will become more closely associated than at present, especially since it is the desire of both to serve humanity in every manner possible to gain the most valuable possession that life can hold, *health.*

# Department of Orthodontic Abstracts and Reviews

Edited by
Dr. Egon Neustadt and Dr. Joseph D. Eby, New York City

All communications concerning further information about abstracted material and the acceptance of articles or books for consideration in this department should be addressed to Dr. Egon Neustadt, 133 East Fifty-Eighth Street, New York City.

**Mouth Infection** by Dr. Oliver T. Osborne. Yale University Press, New Haven, 1934.

In a small volume, the author presents a list of clinical observations on patients in private practice. The object is to impress upon the reader the harmful influence of mouth infections on general health, and to urge a more radical attitude toward the elimination of all infections which may be discovered in the mouth. The cases are classified according to:

1. Infections of the teeth and gums,
2. Tonsil infections,
3. Vincent's infection (trench mouth).

The tongue, adenoids, growths, and the toothbrush.

Patients having infections of the teeth and gums are grouped under the following headings:

A. Those whose symptoms were general.
B. Those who had heart symptoms.
C. Those who had abnormal blood pressure.
D. Those who had disturbances of the blood.
E. Those who had thyroid disturbances.
F. Those who had arthritis, neuritis, myalgic pains, and other rheumatic symptoms.
G. Those who had various abnormal conditions, such as nervous disturbances, skin eruptions, glycosuria, and disturbances of the eyes.

The extraction of diseased teeth and the eradication of sinus and tonsil infections almost invariably have caused improvement, and frequently have resulted in complete recovery from the disturbing conditions present. The author, therefore, expresses the opinion that "dead teeth are always a menace, and that it is inexcusable, if not almost malpractice, to devitalize a tooth, knowing the future menace to the patient, however well the canals might be filled. Pivoted teeth are always a menace. Absorption from a general pyorrhea alveolaris may add its quota to the cause of all kinds of disturbances."

Patients with tonsil infections are improved and often cured after the removal of infected tonsils. "Tonsillar disease, therefore, must be eradicated, and completely, as soon as discovered. Focal infection deeply seated or back of imbedded tonsils is not sufficiently recognized. Tonsils in such cases must most emphatically be removed, even if small."

Vincent's infection is caused by a fusiform bacillus and a spirochete. Each seems to produce the same sort of infection, which responds to the same treatment. "These germs cause persistent ulcers on the tonsils and the gums, and when associated with pus forming germs cause a most serious pyorrhea with even loosening of the teeth, bleeding from the gums, very fetid breath, and may cause a general infection of the body. The immediate treatment consists of abolishing all toothbrushes and cleaning with gauze and cotton, swashing around the teeth with full strength peroxide of hydrogen solution, or swabbing with it, and then the use of strong solutions of sodium perborate several times daily."

The tongue is most generally indicative of the conditions of the gastro-intestinal tract, and it also has a characteristic appearance in scarlet fever, typhoid fever, Addison's disease, etc. "The physician who does not look at the tongue is derelict in his duty."

Exuberant post nasal adenoid tissue is frequent among young children. It may cause deformities of the face and nose, and interfere with the development of the jaws; therefore it should be removed. Furthermore, attention is directed to the probable presence of osteomyelitis, cancer, sarcoma, and actinomycosis.

The author does not approve the use of bristle toothbrushes because they may wound the sensitive mucous membrane and start a canker sore or some other inflammation. A bristle toothbrush once used will develop germs on culture, even if it is washed with ordinary water. "The best method of sterilization is by formaldehyde vapor, but all cheap brushes soon soften and lose their bristles constantly in the mouth and between the teeth. When any infection is present in the mouth, a rubber toothbrush or some gauze or cotton substitute should be used."

The list of clinical conditions serves as a reminder to the physician and the dentist that mouth infections may seriously affect general health.

*Alexander Sved.*

**Dental Histology and Embryology** by Theodore B. Beust, M.D., D.D.S., August, 1934, Philadelphia, W. B. Saunders Company.

Dr. Beust attempts in this volume to correlate the morphologic data of histology with the biologic phenomena occurring in the teeth and their associated structures. His object is to present to the reader the scientific foundation for the theories which are being advanced by modern dietitians and investigators of dental caries.

This view of explaining the physiologic happenings by means of the anatomic description is carefully carried out in the chapters dealing with enamel, dentin, and cementum. The structural characteristics of these tissues are described in a simple and instructive manner. The differentiation between primary and secondary dentin is considered as unjustified, as "dentin deposition is a continuous process, active throughout the life of the pulp regardless of whether the tooth is erupted or not." In a similar manner, cement deposition is also continuous throughout life. Teeth of adults exhibit heavier

deposits of cementum than those of children. The claim that hypercementosis is due to excessive stress and malocclusion is not accepted by the author.

### DENTIN

The chapter on the biology of the dental tissues reads like a page from a history book. Decay is the aggressor, and it sends its troops into the dentin, after destroying the first line of defense, the enamel. The dentin, which in the newly erupted tooth consists of uniformly translucent tubules, permeable to dies, becomes in part opaque, sclerosed, and impermeable. This takes place through the irritation from caries, abrasions, erosions, or exposure to trauma. A certain amount of opacity of dentin is, however, a normal growth phenomenon, and its formation is accelerated only through the irritations. This opaque dentin is by no means dead. Sclerosis retards the progress of caries to the point of completely stopping it (healed caries).

Calcification of the outer parts of the pulp is only one stage in the process of tooth maturation. It is intended to keep pace with the progress of tooth abrasion. In this process of maturation, the number of odontoblasts and lymph conducting tubules gradually decreases while the opaque and transparent tubules increase. This provides for a greater resistance to chemicals, to wear, and to trauma.

### ENAMEL

Analogous reactions appear in the enamel after eruption, though enamel metabolism is not comparable to that occurring in organic tissues. The fact that stains brought into the pulp cavities can diffuse into the enamel justifies the view that a physiologic infiltration of lymph may take place. Susceptibility to dietary deficiencies may be explained in this way as well as the appearance of zones of higher resistance found in the enamel of teeth with slowly progressing caries. These zones of resistance are comparable to the translucent zones in the dentin.

### PERIDENTAL MEMBRANE

The peridental membrane which suspends the tooth in its alveolus is able to withstand enormous stresses. Through deposition of bone on one side, and of cementum on the other side, its thickness decreases with age. But it also varies with function and increases if the function to which the tooth is subjected increases. (The author's belief that the osteoblasts and cementoblasts in the peridental membrane are derived from the fibroblasts may be questioned. The fibroblasts are already highly specialized cells, and they, as well as the highly specialized osteoblasts and cementoblasts, are probably derived from an undifferentiated mother cell, the embryonic mesenchyme cell, which is present everywhere that connective tissue is found.)

### JAW BONE

Like the other dental tissues, the jaw bone also is "acutely sensitive to alterations in the functions imposed on it." If one part of the jaw is kept

in disuse, a thinning of the bone trabeculae occurs accompanied by a widening of the marrow spaces. The manner in which bone (bundle bone) is deposited on the distal walls of the alveoli and sometimes on the buccal or lingual walls indicates that a physiologic movement of the teeth occurs in a forward direction and sometimes in a buccal or lingual direction.

EMBRYOLOGY

The chapter on embryology deals with the growth of the face, the mouth, and the jaws. It also includes the postnatal development of the teeth. The formation of the teeth is described with great clearness, first by means of analogies in the formation of placoid scales, and the tooth bearing cord of the shark with its continuous replacement of damaged teeth. After a discussion of the manner in which the tissues participate in the development, the formation of the human tooth is taken up. The older theories regarding tooth development and also the most modern thoughts on these subjects are recorded.

The volume is illustrated with fine photomicrographs, all of which are original with the author. There is also a number of instructive diagrams, very cleverly used in the author's endeavor to simplify explanations, theories, and descriptions which in the field of histology sometimes tend to become ponderous and complicated. In certain parts, the author might have gone even further on this road to simplification.

Another valuable feature of the book is the attempt to correlate the "cut and dried" microscopic sections with biological happenings and clinical findings. A good example of this endeavor is found in the chapter on the relationship between histologic tooth structure and cavity wall reparation. Such an attitude is conducive toward tearing down the wall that often has limited histologic interest to a small and highly specialized class. It will help the average dentist toward a better understanding of his work, and will help to remove the spell of fear which invariably appears on his face when histology is mentioned.

*E. N.*

# The Forum

Articles for this department should be sent to Dr. Albert H. Ketcham and Dr. William R. Humphrey, 1232 Republic Bldg., Denver, Colo.

## A Course of Study in Dentistry

In presenting "A Course of Study in Dentistry," a report of the Curriculum Survey Committee of the American Association of Dental Schools made possible by a grant from the Carnegie Corporation of New York, the Committee is to be congratulated. It has done in a thorough fashion a very difficult and extensive piece of work, and every phase of dental education will unquestionably profit by it.

For some years there has been among dental educators a great deal of discussion as to whether orthodontia should be taught in the undergraduate school or as a postgraduate course. The general agreement seems to be that some instruction is advisable and necessary for undergraduate students.

The report states ". . . . dental schools are confronted with the problem of formulating a course of study whereby the undergraduate student of dentistry may acquire sufficient knowledge and ability to recognize malocclusion, to use preventive measures and treat some of the less complicated cases."

It further states that "not infrequently the statement is made in print that the simpler cases cannot be distinguished from the more difficult ones. It would seem to constitute a serious indictment of orthodontists to say that they are unable to make a reasonable prognosis of a case. The statement seems to carry in it the idea that cases of malocclusion are treated by trial and error rather than by well-planned procedure."

With the phrases "to recognize malocclusion" and "to use preventive measures," I am in entire accord. Every general practitioner of dentistry should recognize malocclusion, and having done so he should do all he can to have the condition corrected instead of building up opposition to treatment. If preventive measures were used, the welfare of the children of this country would be greatly enhanced.

Let us consider briefly the reference made to the treatment of "less complicated cases" and the inability of the orthodontist to recognize them. If the experienced orthodontist were able to predetermine the ease with which a case could be treated, his life would be made considerably easier and much happier. How, then, can a general practitioner with little experience be expected to distinguish the simple cases when the man with adequate training and much experience is unable to pick them out?

Dr. John V. Mershon has frequently said that we can move teeth where we think they ought to be, but Nature moves them where she knows they

should be. The treatment of malocclusion contemplates something much deeper than merely moving teeth, something which deals with life, something about which we know very little.

Cases of malocclusion which are treated by well-planned procedures are really after all treated by trial and error just as are cases of pneumonia or typhoid fever. If this were not true, why should some patients get well while others under the same treatment die?

It is entirely true that some cases of malocclusion are perfectly simple to treat while others are more difficult; but to determine this before treatment is started is impossible, and to say that it is a "serious indictment of orthodontists to say that they are unable to make a reasonable prognosis" is hardly fair.

*Wm. Tyler Haynes.*

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On account of certain accumulated correspondence pertaining to the question of the extraction of teeth for the correction of malocclusions, the Forum herewith publishes some of this correspondence upon its own merits. This correspondence in no way reflects the opinion of the editorial staff of the Journal, nor do the editors assume any responsibility in publishing these opinions. They are given here merely to reflect a trend of orthodontic thought that is not new, but is highly controversial in character.

### Extraction

Dear Dr. Pollock:

It is difficult to criticize Dr. Fine's ideas, claims, figures, results, and statements, published in the October, 1934, issue of the *Dental Digest*, without casting what might seem to be reflections upon him personally. I do not know Dr. Fine and, therefore, am the more anxious not to offend him or his friends, but I do abhor that conception of dentistry. In fact, those possessing it are not to be blamed, but rather the institutions educating dentists are culpable. It is the old story of giving poor dentistry to the poor.

Dr. Fine's photographic reproductions are most unfortunate. The flat photographic lighting given the casts obscures the ugly realities of his results. Had these casts been properly lighted, the photographs would have revealed so well the guilty faults of his treatment that no unsophisticated neophyte would take any cognizance of the article. Besides, the cuts are small, which reduces faults that would be glaring in larger reproductions. The *Dental Digest* is responsible for these unfortunate reproductions, which were made too small and from contact prints of poor negatives. Critical examinations of the cuts of the unrelated mounted casts, however, show all to be gross failures. Almost every case shows perverted interdigitations of teeth. All that has been attempted by the treatment is a window dressing of the mouth, leaving the main masticating machinery wrecked. That is not even good dentistry.

His published claims and methods are not new. Many of the earlier orthodontists used them to their great sorrow. They saw how bad such results were, even when they had no x-ray pictures to disclose the bad results of tipping teeth to close gaps caused by extractions or of allowing them to tip into some sort of contact closure.

*Harvey Stallard.*

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Dear Dr. Pollock:

I read with a great deal of interest your editorial "Extraction of Teeth in Treatment" in the December issue on the article "Judicious Extraction in the Treatment of Malocclusion" which appeared in the October, 1934, issue of the *Dental Digest.*

In one instance it seems to me that you favor extraction in orthodontic treatment when you assert that, "There has never been any particular controversy over extraction in mutilated cases in adult life . . . compromise treatment is oftentimes the only way out for improvement; there may be no other choice." In regard to extraction in adult life, I question whether it is advisable after sixteen or eighteen years of age. If an orthodontist of experience feels that extraction is indicated, it is my opinion that it should be done at an earlier age; especially the premolar when there is no room for the canine to erupt in its proper place.

In regard to your statement "To offer as an exhibit in evidence only photographs of the teeth and of plaster casts means that the evidence for it begins only with the teeth and ends there," I should think that showing photographs of cases two to twelve years after treatment should carry some weight for evidence of the efficacy of any treatment.

I believe the dental profession will understand me correctly in the statement, "I have never extracted a cuspid for the correction of malocclusion." You and I know that this has been done and it is wrong. I made this clear at a recent meeting of the Third District of New York, and it is my hope that the article will help check any further extraction of canines, so that "the usual avalanche of the extraction of canines" will not follow.

The article in question contains a statement, "I have read that if an orthodontist obtains 30 to 40 per cent successful results it is considered a good average." This statement should have read "50 per cent" and it is not a "careless" statement. You will find it in the splendid article "Extra-oral Pressures in the Etiology of Malocclusion" in your May, 1930, issue, page 523, last paragraph in which Dr. Harvey Stallard says, "I talk frankly about my failures, because 50 per cent of my cases fail in spite of everything I can do. I have no hesitancy in speaking this way because, like Rousseau, I am no worse in experience than any other orthodontist. I have not made a close check on my practice, but in it there is a high percentage of failures. If you get 50 per cent of your cases to stay nice, you are doing wonderful work."

It is still my opinion that the article was timely, rational and practical until you or some other orthodontist will prove that the treatment and results are not good. It is common knowledge that many orthodontists extract for obvious reasons. No specific treatment or uniform extraction was outlined in the article, but it did point out cases in which I thought that extraction was indicated, and it was left for the reader to draw his own conclusions. I believe also that I made it very clear that I use and advocate the use of appliances where they are indicated; but the article dealt with "Judicious Extraction."

Were it not for the fact that I have received so many favorable comments on my article from general practitioners and orthodontists in this country and in Europe, I would let this whole matter rest; but, as it is, I hope you will find it possible to print this letter as an answer to your editorial.

*Samuel Fine.*

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# Editorials

## The New York Meeting of the American Society of Orthodontists

AFTER a span of almost thirty years the annual meeting of the American Society of Orthodontists was again held in New York City, April 30 to May 3. This was the largest and best attended meeting the Society has ever had. It is reported that there was an attendance of more than five hundred.

The thirty-third meeting was well organized, was handled in a highly efficient manner, and reflected smooth functioning committees which knew their jobs and had given their work an infinite amount of attention.

The main issue of the meeting, the proposed change in the Constitution and By-laws, which had attracted attention throughout America, failed of

adoption. The proposed change, in brief, was the reorganization of the American Society of Orthodontists on similar lines to the present organization of the Amerian Dental Association. This would permit the district or component societies to become members of the parent organization and to pay dues and belong to what might be called, under these circumstances, "organized orthodontia." Although the reorganization plan was rejected in its present form, it was, however, formally accepted in principle and was voted to be held over for another year.

The meeting was both comprehensive and extensive, and a number of highly scientific papers were on the program. The scientific exhibit also was splendid and reflected an immense amount of work in its preparation.

The first day of the meeting was devoted to recreation, at the beautiful Winged Foot Golf Club at Mamaroneck, New York. The weather man was very kind and the golfers enjoyed a perfect day, which was brought to a happy conclusion by the annual golf dinner held at the club in the evening. Members from outside the metropolitan area were guests of the Society at the Radio City Music Hall from time to time during the meeting to listen to interesting broadcasts over national radio hookups.

The scientific papers and the various clinics will be published during the coming year in the INTERNATIONAL JOURNAL OF ORTHODONTIA AND DENTISTRY FOR CHILDREN.

The following officers were elected for the coming year: Paul G. Spencer, Waco, Texas, president-elect; James McCoy, Los Angeles, California, vice president; Claude R. Wood, Knoxville, Tennessee, secretary. H. C. Pollock was installed as president for the current year. The next meeting will be held in St. Louis, Mo., April 20-23, 1936.

*H. C. P.*

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## Credit and Collections of Professional Men

THE professions of medicine and dentistry are now suffering the most excruciating growing pains of their existence in trying to work out a reasonable working hypothesis for their future status. It has been contended that unfortunately physicians and dentists have always been paid last, that is, after the butcher and the candlestick maker; and this contention has now been found definitely to be based on truth.

A recent report from the Department of Commerce on a study of consumer debt amply proves that the professional man's contention is true. It shows that in proportion to the volume of accounts receivable and outstanding, 66.6 per cent of the physicians' and 55.6 per cent of the dentists' accounts were delinquent at the close of 1933, while at the same time retailers' accounts were found to be only 13 per cent delinquent. The report was made from 718 returns from twenty different states, and presents some interesting facts, particularly to professional men. For instance, according to the study, professional men do 90 per cent of their business on credit as compared to an average of 54 per cent for retailers. Retailers spend 12 per cent of the amount collected in collection

costs; professional men, 15 per cent. Among retailers the larger the sales the smaller the proportion of accounts which are classed as delinquent.

Of further interest to professional men are the possible reasons given for this striking variation between delinquencies in retail and those in professional accounts. The principal reasons are: first, that the retailer secures better credit investigation preliminary to making the transaction; second, and what is probably more responsible, that a professional man necessarily does not and usually will not resort to the aggressive collection tactics customary among retail creditors.

This study indicates that professional men collectively are feeling the sting of economic conditions much more than business men. As the proportion of volume of accounts receivable by professional men is 66.6 per cent, any sane-minded person knows that this condition cannot endure—that it is an economic tragedy. He knows that, if this is true, professional men cannot continue to exist for long unless they completely change these conditions. Changing these conditions is the big problem before each and every individual in the professions at this time, and it is also one of the most important problems ever confronted by organized medicine and dentistry. Professional men must be alert; they must put their heads and shoulders to the task of working out from this predicament, of putting their house in order; because whatever the government may or may not do, it certainly will not pay bills, neither will it collect bills receivable, for the physician and the dentist. It must also be realized that as time passes income taxes will become progressively sharper and higher in the modest income brackets.

*H. C. P.*

# In Memoriam

## IN MEMORIAM RESOLUTION OF THE AMERICAN SOCIETY FOR THE PROMOTION OF DENTISTRY FOR CHILDREN

### F. Blaine Rhobotham

WHEREAS, the Omnipotent has deemed it fitting to remove from the scenes of his labor on this earth F. Blaine Rhobotham, and

WHEREAS, the American Society for the Promotion of Dentistry for Children is deeply indebted to the late F. Blaine Rhobotham for his pioneering contributions to children's dentistry and for his untiring and unselfish efforts to improve child health through this branch of the dental profession, and

WHEREAS, he has served faithfully and capably as an officer and counsellor and has set an example that many other men will emulate and follow; be it therefore

*Resolved,* That we, the members of this Society, hereby express our sorrow in his passing and extend our deepest sympathy to his wife and son; and be it further

*Resolved,* That these resolutions be spread upon the minutes of this Society and that copies be sent to Mrs. F. Blaine Rhobotham, and printed in the *Review* of the American Society for the Promotion of Dentistry for Children.

# News and Notes

## American Dental Assistants Association

The eleventh annual meeting of the American Dental Assistants Association will be held in New Orleans, Nov. 4-8. Headquarters will be at the Bienville Hotel. For further information address

LUCILE S. HODGE, General Secretary,
401 Medical Arts Building,
Knoxville, Tenn.

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## Southern Society of Orthodontists

The fourteenth annual meeting of the Southern Society of Orthodontists will be held at the Signal Mountain Hotel, Chattanooga, Tenn., on September 30, October 1 and 2.

Members of the dental and medical professions are cordially invited.

WINSTON P. CAINE, President,
Medical Arts Building,
Chattanooga, Tenn.

WILLIAM P. WOOD, JR., Secretary,
442 W. Lafayette Street,
Tampa, Florida.

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## International Congress at Vienna in 1936

The Quinquennial International Congress of 1936 will be held August 2 to 8, in Vienna, Austria. It has been planned that communications will be read in the mornings and demonstrations will be given in the afternoons.

GEORGE VILLAIN, President
Paris.

CH. F. L. NORD, Secretary
The Hague.

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## Pacific Coast Society of Orthodontists

Southern section of the Pacific Coast Society of Orthodontists met in Los Angeles, March 8, 1935. This was the regular quarterly meeting, was held at the University Club, C. E. Thompson presiding.

The proposed amendment to the Constitution of the Pacific Coast Society of Orthodontists, relative to past service membership was read to those present.

Dr. John E. Taylor, newly elected president of the Pacific Coast Society of Orthodontists, gave a short talk, thanking the members for their support and expressing gratification of the spirit which prevails in the organization.

A letter from Dr. Taylor, tendering his resignation as a director in the Pacific Coast Society of Orthodontists was read. Dr. Ben L. Reese was elected to the office vacated by Dr. Taylor.

Dr. Dallas McCauley gave a review of the Pacific Coast Society Meeting held in San Francisco in February of this year. Dr. McCauley selected the vital points in the various contributions made at the San Francisco meeting, thereby making the points clearer and increasing the value of that meeting.

Dr. J. L. Carman of Denver spoke on the subject of chrome alloy, illustrating with motion pictures. Dr. Carman gave an extremely interesting résumé of the progress which is being made in perfecting the materials used and the technic associated with them. He outlined the difficulties encountered in developing satisfactory manipulation of chrome alloy and stressed the fact that success in its use depends on an accurate technic. Dr. Carman stated that better work is possible with chrome alloy and predicted a general acceptance of it by the profession.

In the general discussion which followed Dr. James McCoy stressed the point that in considering the use of chrome alloy, its mechanical possibilities should be emphasized rather than its low cost.

MEMBERS AND GUESTS PRESENT

*Members*

C. M. Alderson
William Armstrong
Walter Furie
Eugene Gould
Aldys Gray
Alfred Higson
A. F. Heimlich
E. M. Johnston
Dallas McCauley
James McCoy
John McCoy
Hays Nance
E. C. Read
Ben Reese
J. C. Roberts
John Taylor
C. E. Thompson
George Turner

*Guests*

J. L. Carman
G. C. Chuck
Harry Faulkner
L. E. Habegger
Herbert Shanon
F. W. Fahrney